FIFTIETH ANNIVERSARY

Illinois Glass Company
Alton, Illinois

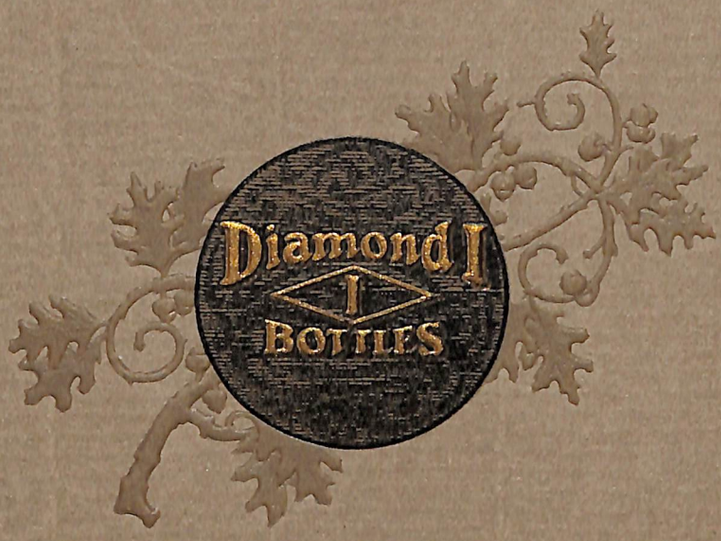




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Mr. Benjamin L. Powell,
1327 East 5th Street,
Alton, Illinois.

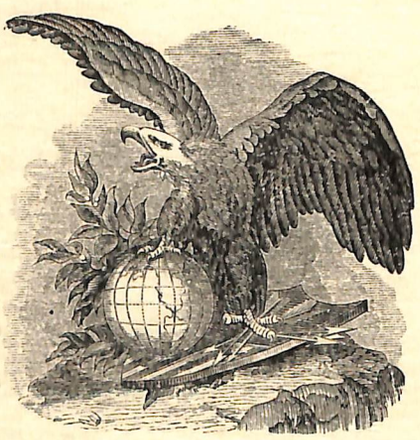
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Illinois Glass Company

the Institution

50TH ANNIVERSARY



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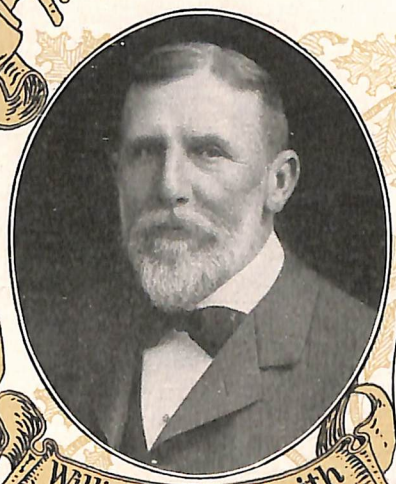
FIFTY YEARS *of* ACHIEVEMENT IN BUILDING UP A SERVICE OF BETTER BOTTLES

Illinois Glass Company
Alton, Illinois

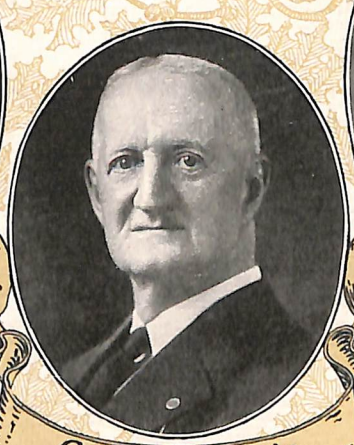


THIS BOOK PRINTED BY
CARTON & LABEL DIVISION
Illinois Glass Company

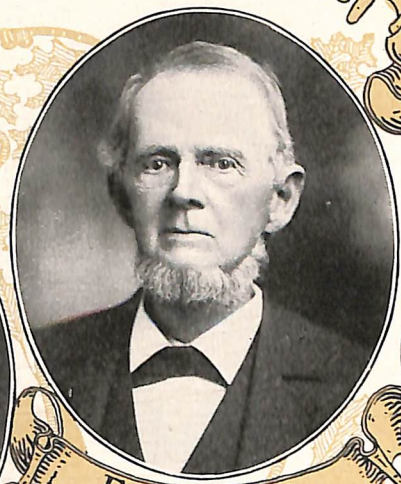
FOUNDERS OF THE COMPANY AND ITS PRESENT OFFICERS



William Eliot Smith
1844 FOUNDER 1909



George M. Levis
PRESIDENT



Edward Levis
1819 FOUNDER 1903



John M. Levis
VICE PRESIDENT



Frank Ferguson
SECRETARY



R. H. Levis
VICE PRESIDENT AND TREASURER



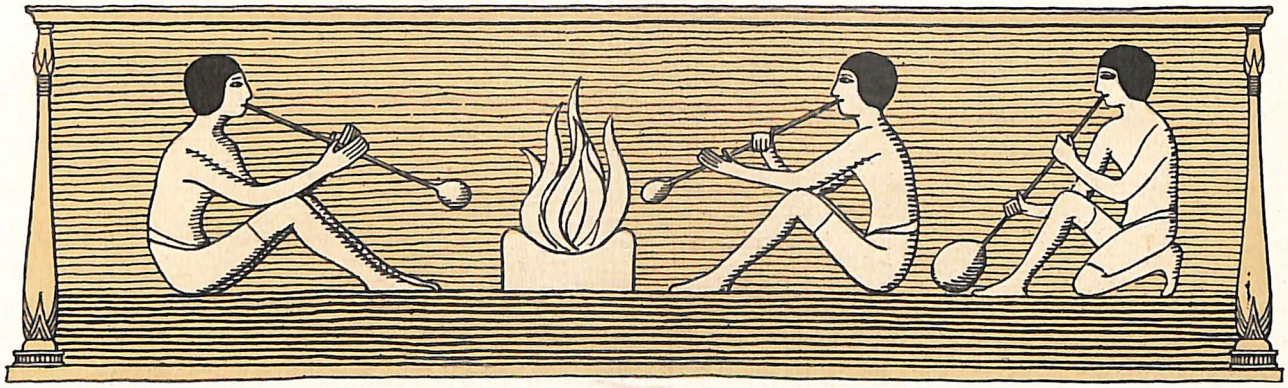
Charles Levis
VICE PRESIDENT



Nelson Levis
VICE PRESIDENT



Oscar S. Thompson
VICE PRESIDENT



FOREWORD *and* INTRODUCTION

AS THE complexity of civilized life increases, new needs and desires are developed; and glass, one of the simplest and yet one of the most wonderful of man's inventions, is constantly put to new uses.

We read of glass bottom boats through which the delighted traveller is afforded a glimpse of the wonders of the deep; of a bridge in Colorado, the floor of which is made of glass; of a street in Lyons, France, that is paved with glass blocks; we are told of glass water pipes and telegraph poles, and that dresses, table cloths, curtains and napkins have been made of glass.

We all know that in the arts, the sciences, in mechanics, and in building, glass is indispensable. Without it many of the comforts, beauties and pleasures of modern civilization would be lost.

Many of the important experiments in chemistry and physics depend largely for their success upon glass in some form. In the microscope, glass enables the biologist to see and study life in the microbe world. The telescope with its lenses reveals many of the mysteries of the heavenly bodies.

Glass is also indispensable for shielding various delicate instruments, such as the watch, the steam gauge for boilers and the compass of the mariner. In the form of spectacles it has proved a boon to humanity, remedying defects of vision and renewing the sight of the aged. Without its aid the photographer would be unable to preserve for us the features of our friends. The prism is able to decompose light itself, and we can almost change night into day by the many brilliant lighting effects that glass enables us to produce.

Our glass windows admit light and sunshine, protect us from the elements, and yet permit us to see the beauties of the outer world. The mirror with its thousand uses would be practically unknown today except for glass.

And as more and more attention is paid to sanitation and public hygiene, the demand for glass containers for fluids and for food products steadily increases.

The peculiar qualities of glass—its transparency, its hardness, its plasticity under the influence of heat, its cleanliness, its resistance to the action of elements and compounds which injuriously affect all other substances out of which containers may be made—these characteristics of glass make it an indispensable servant and minister, without whose help modern business and commerce would suffer greatly.

EARLY HISTORY OF GLASS MAKING

THERE is no study more interesting than that of the process of development—whether of plant, animal or industry. An acorn falls from the tree to the ground and lies for months apparently unchanged; then, at last, it begins to unfold, to grow, at first slowly, then more and more rapidly, until we have before us a much greater miracle than the famous problem of King Alfred. We have to explain, not how the apple got into the dumpling, but how the mighty oak tree came out of the tiny acorn.

If we study the history of any great industry, we usually find, as in the case of the oak tree, a long period of apparent inactivity and slow development followed by periods of startlingly rapid change and growth.

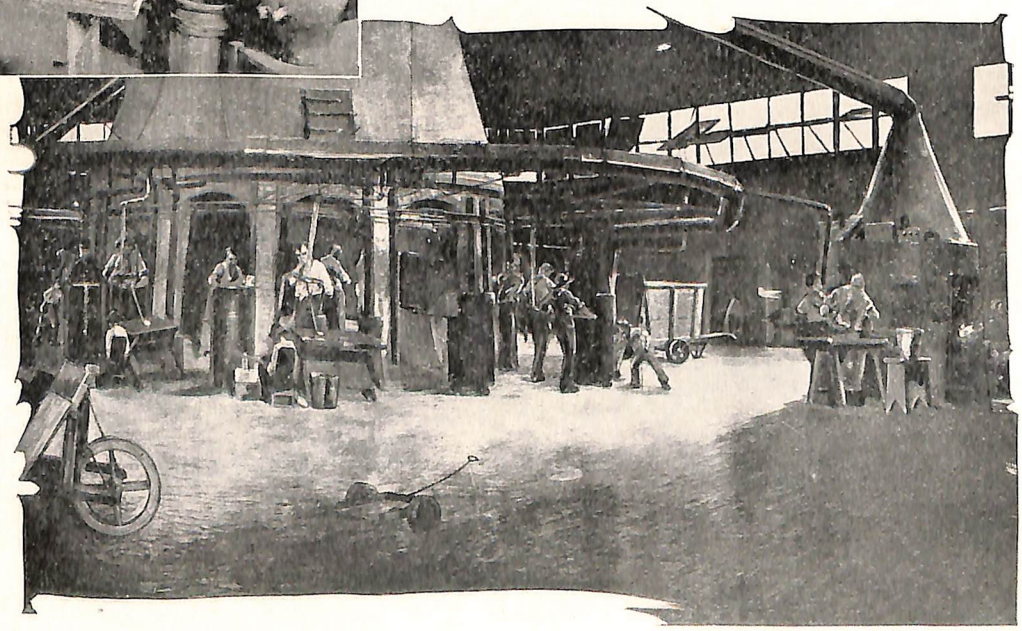
Take the glass industry, which though not as old as pottery making, is certainly ancient enough to command respect. Upon the monuments of ancient Egypt are figures of men with their blow pipes evidently engaged in blowing bottles in a manner strikingly similar to that used in our own plants up to 1915, and still employed in many factories today.

In ancient Tyre whole streets were occupied by glass making establishments. Later Rome seems to have been the glass manufacturers' headquarters. Pliny tells us that glass houses were well known in his day to beggars and loungers as a place of refuge from cold weather. From Rome the manufacture spread throughout Italy, Bohemia, Germany, France and England, and then finally to America.

When Venice was the glass making center of the world, the glass maker was considered superior in standing to the ordinary workman, and titles of nobility were granted him, evincing the appreciation in which the art was held. In the year 1510 a certain French writer said—"Glass making is a noble art, and those engaged in it are noble." The manufacture of glass was also guarded very carefully in Venice, and the secrets of the trade were protected by the most stringent rules and regulations. Apparently in those days embargoes



By courtesy of the Metropolitan Museum of Art, New York, we reproduce above "The Glass Blowers of Murano," a celebrated painting by Charles F. Ulrich.



To the right is an interior view of our Alton Plant in the early days, with one of the old pot furnaces as the center of activity.

might be laid not only upon exports but upon workmen; for we find the following law:

"If a workman carries his art into a foreign country to the detriment of the republic, an order to return will be sent to him. If he does not obey, his nearest relative will be put in prison. If in spite of the imprisonment of his relations he should persist in remaining abroad, an emissary will be charged to kill him."

Records of two cases of assassination in Germany, of which the victims were glassworkers, seem to indicate that this law was enforced.

The glass business of the United States is also venerable, as we count age in this new world. The first bottle blown in America was made in a factory set up in the woods one mile from Jamestown, Virginia, in 1608, twelve years before the landing of the Pilgrims; and the common glass bottle bears the distinction of being the first manufactured product exported from this country.

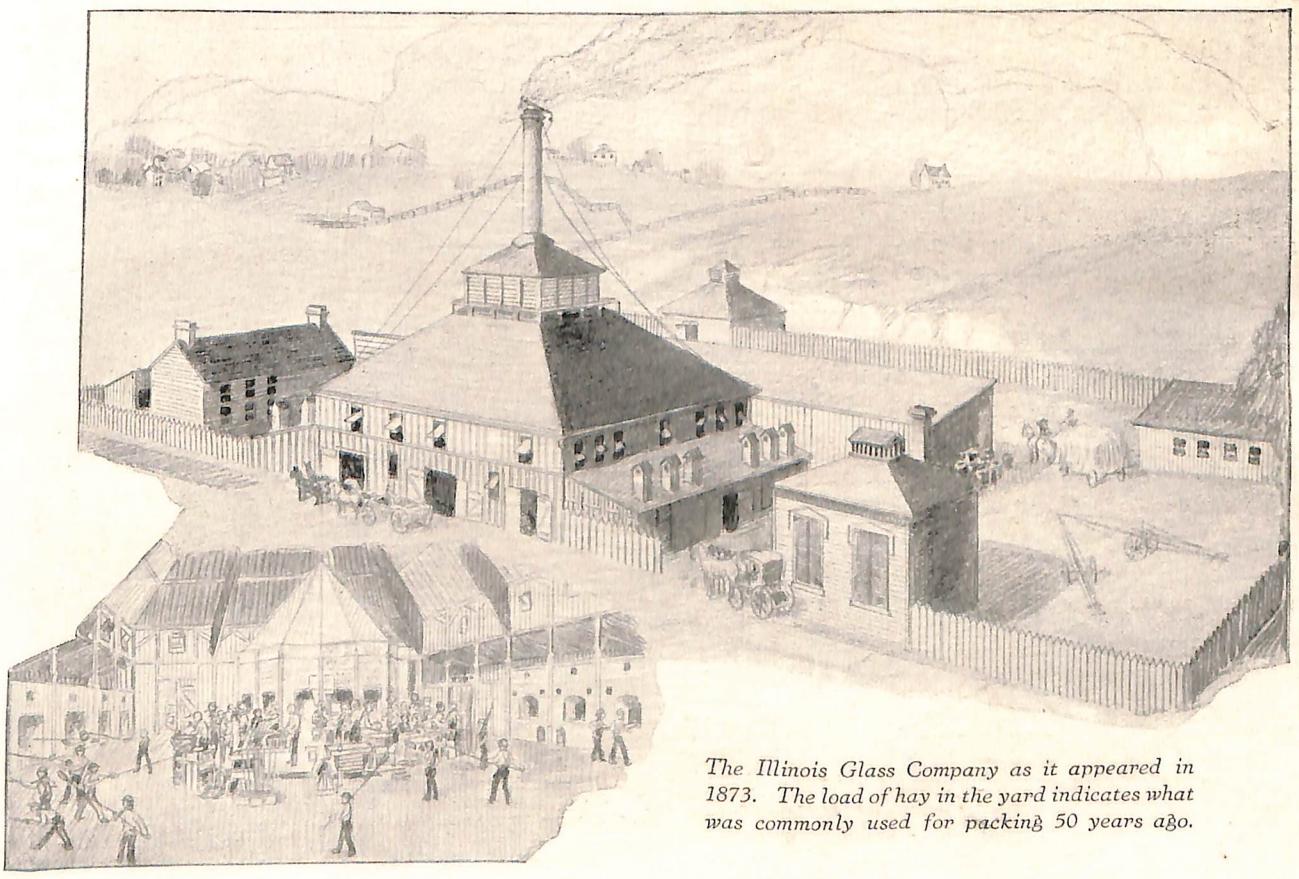
In the early days the manufacture of bottles was naturally confined to the Eastern section of the United States, but gradually the industry spread Westward. Thus it was, that in August, 1873, fifty years ago, the Illinois Glass Company was incorporated in Alton, Illinois, with Mr. William Eliot Smith as President and Mr. Edward Levis as Secretary and Treasurer.

PERSONALITIES BACK OF THE COMPANY

THE start was made on very limited capital and the first plant consisted of but one small five-pot furnace. In those early days, Mr. Smith, President of the Company, was its only salesman; and even today some of our old friends still remember his calls and genial personality. Up to the time of his death in 1909, in Florence, Italy, Mr. Smith kept in active charge of a business that had expanded and progressed beyond his fondest dreams.

Mr. Edward Levis was in charge of the factories and production end of the business. He managed the plant while Mr. Smith was out on the road. Later, Mr. Levis became Vice President of the Company, a position which he held until his death in 1903.

Beside giving time, energy and untiring effort to the Company, Edward Levis made another contribution. He gave six sons, all of whom went to work in the factory as soon as they were able. Beginning at the bottom and working for low



The Illinois Glass Company as it appeared in 1873. The load of hay in the yard indicates what was commonly used for packing 50 years ago.



In 1887 the work of expansion had already begun, as is evidenced by this picture.

wages, all of the Levis Brothers have come up through the ranks and the practical experience thus gained has stood them in good stead through the years.

Five of these men are Officials of the Company at the present time. Is it any wonder with their early training, long years of intimate contact with the business, pioneering courage and keen judgment that they should stand today among the leaders of the glass container world?

Their lives have been dedicated to the nobility of work. Hours, energy and thought they gave in reckless abandon to the affairs and success of the Company.

The early experiences of these men naturally made them look upon their fellow workers with a spirit of sympathy and understanding; and by maintaining close touch with the organization, they succeeded in developing a feeling of true loyalty among the men that has been an important factor in the success of the Company.

Whenever these executives go into the factory it is still "Hello, John," "How are you, Jim?", for most of the workmen in their employ they call by their given names. Perhaps that has something to do with the fact that many of their "boys" have stayed with them for thirty to forty years. They are with friends and they know it. There are no barricades to run, no closed doors to any one with ideas and suggestions. Even personal matters are discussed freely with these officials, who are always glad to listen and give good, sound advice and assistance.

The loyalty of those connected with the Illinois Glass Company represents one of its greatest assets; and it is our desire—here and now—to pay tribute to this wonderful spirit of co-operation that exists throughout the organization. It means that every man and woman in the institution is giving his or her best to see that the customer receives quality ware and good service.

Such a spirit within an organization cannot help but make friends outside. Consequently, it is with a feeling of pride and pleasure that we note how many old time buyers, who purchased their first bottles from us, are still true friends of the Company.

It is said that a business institution is simply the lengthened shadow of the men at its head.

They direct the policies and establish the principles on which it is to operate. In short, it is a reflection of their character.

THE HAND BLOWN PROCESS

UNTIL very recently, all bottles were blown by a glass blower equipped with what is termed a Blow Pipe, which is a hollow iron pipe, varying in length and thickness according to the size of the bottle to be produced. Dipping the end of this blow pipe into the molten glass, the blower by twisting the pipe about, gathers what he judges to be the proper quantity of glass for the bottle on which he is working. Then, after shaping the mass of glass slightly by rolling it on a stone or plate, he lowers it into the mold and uses "lung pressure" to expand it to the limiting walls of the mold. The bottle is then removed from the mold and, in another operation, the neck is reheated and shaped by a tool for the proper corkage.

In the early days bottles were manufactured exclusively in what were termed pot furnaces—that is, circular furnaces having in their walls openings or arches, in which were placed pots or clay crucibles where the glass was melted. The raw materials were fed into the pots and after a sufficient period of time had elapsed to allow the melting process to be accomplished, the workmen came upon the scene with their blow pipes, and the glass was worked out of each of the pots. Then the blowing operation ceased, the pots were refilled, the melting process started, followed by another blowing period.

In the old pot furnace, bottles could only be blown at intervals, while with the continuous tank the work goes on day and night without interruption, the filling in process in no wise interfering with the blowing.

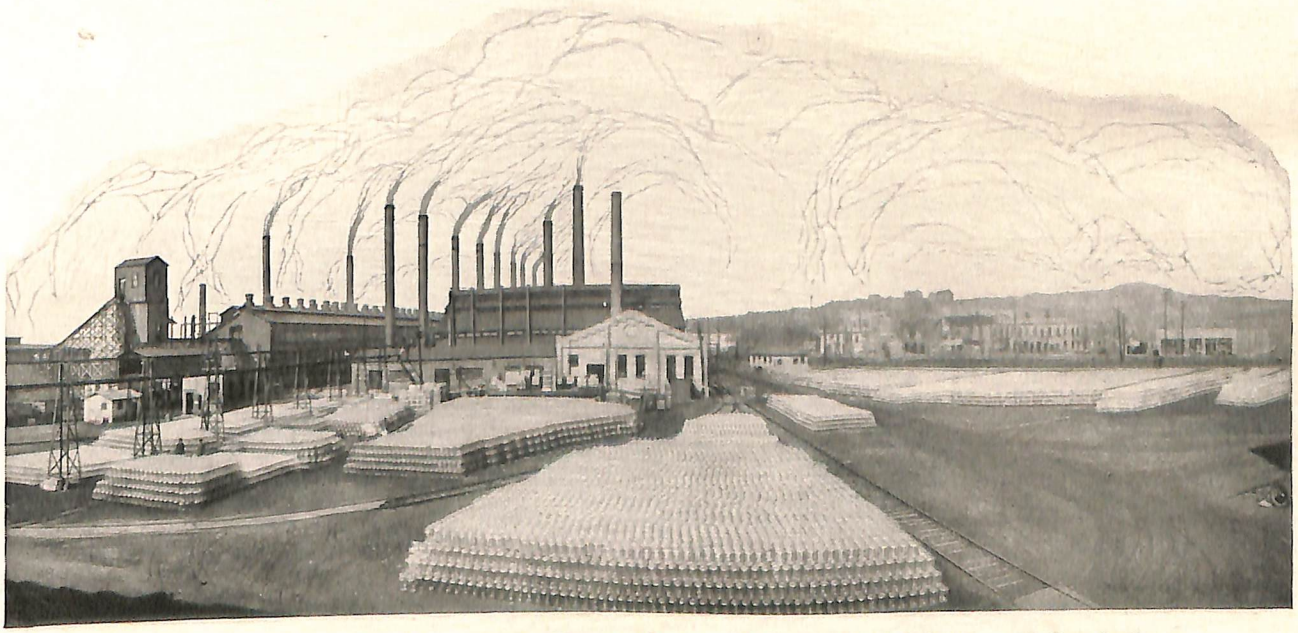
This, briefly, was the process and method of bottle making when the Illinois Glass Company started in business. And it had no reason to suspect, in those early days, the magnitude of the upheaval that was to occur in the bottle industry some thirty-five years later with the introduction of Automatic Machinery.

When a process of manufacture goes along for 3500 years, without any radical changes, and is then discarded over night, it amounts to a veritable revolution.

INTRODUCING THE AUTOMATIC MACHINE

THE story of the development of the Automatic Bottle Blowing Machine, is the old, old story of the years of costly experiment, failures and heartaches, that practically every inventor has had to go through before success crowned his efforts.

The first successful Bottle Blowing Machine was made in America in 1906—the first one was



A corner of the Alton Plant as it is today—with acres of Big Bottles and Carboys piled up in the yard awaiting shipment.

installed by this Company in 1910. At this time, we were operating one of the largest hand blown plants in America, employing many hundreds of glass blowers and workmen. It was no easy task, therefore, to pioneer the introduction of a machine that would spell the end of a craft that had endured for centuries.

But the history of every trade shows that once a practical machine has been invented, it will inevitably displace hand labor; and that the immediate loss to the skilled workmen is more than counterbalanced by the gain to society at large.

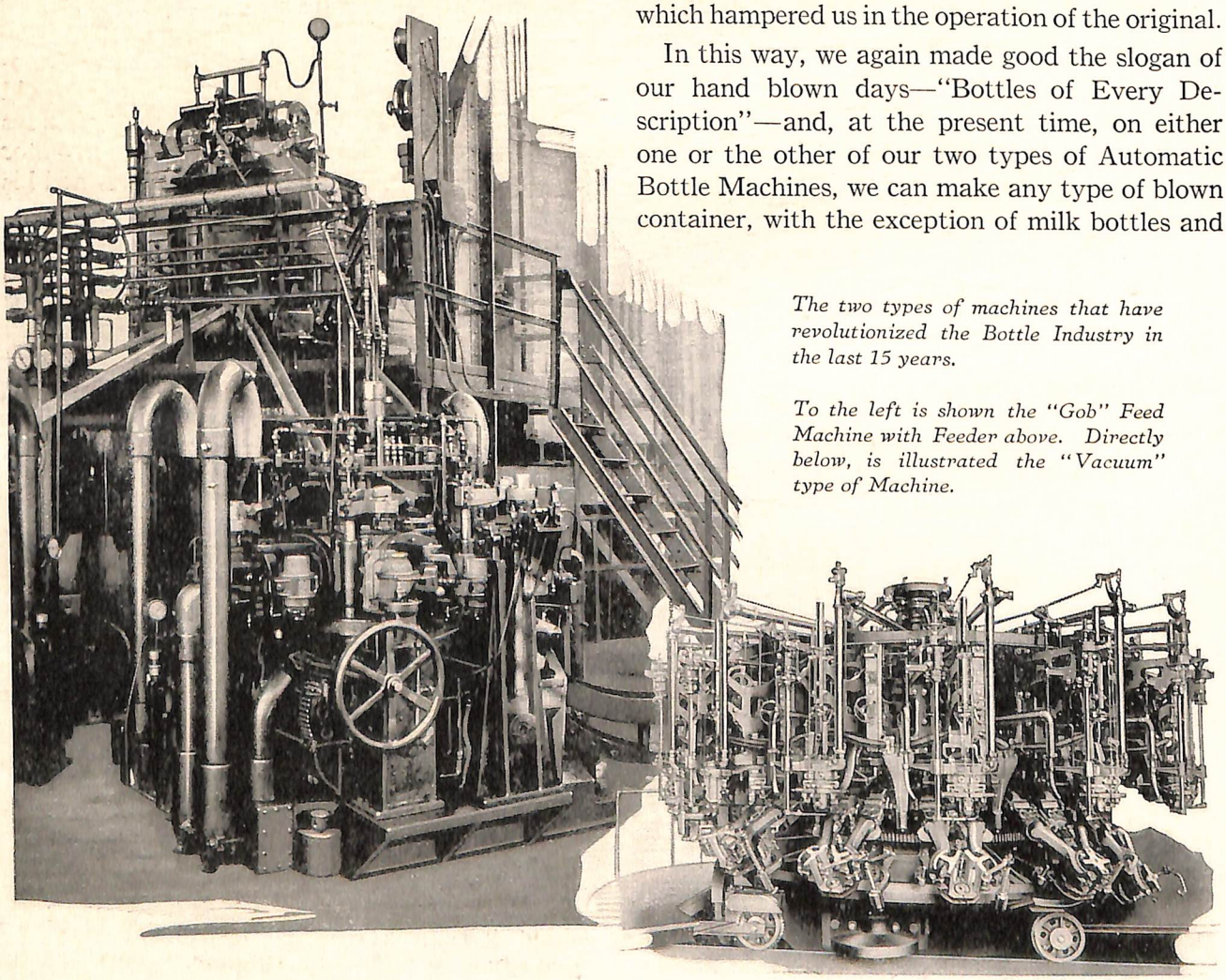
It was one of those times in business that try mens' souls. It meant substituting large, complex and expensive machinery for hand labor; it meant that even our furnaces would all have to be rebuilt and increased tremendously in size.

This decision on the part of our executives to change from the hand blown process to machine manufacture, when the whole idea was revolutionary, shows the broad, sound views they are inclined to take on all matters of policy and expansion. It required vision and imagination to peer into the future and see what was written there. It took confidence and faith to steer the ship into such an uncharted and turbulent sea.

But they did it—and their judgement has since been vindicated many times over. One of the last reports we have on this subject shows that now, in less than a quarter of a century after the transition began, only about six per cent of the bottles produced in this country are blown by hand. The rest are made on various types of machines.

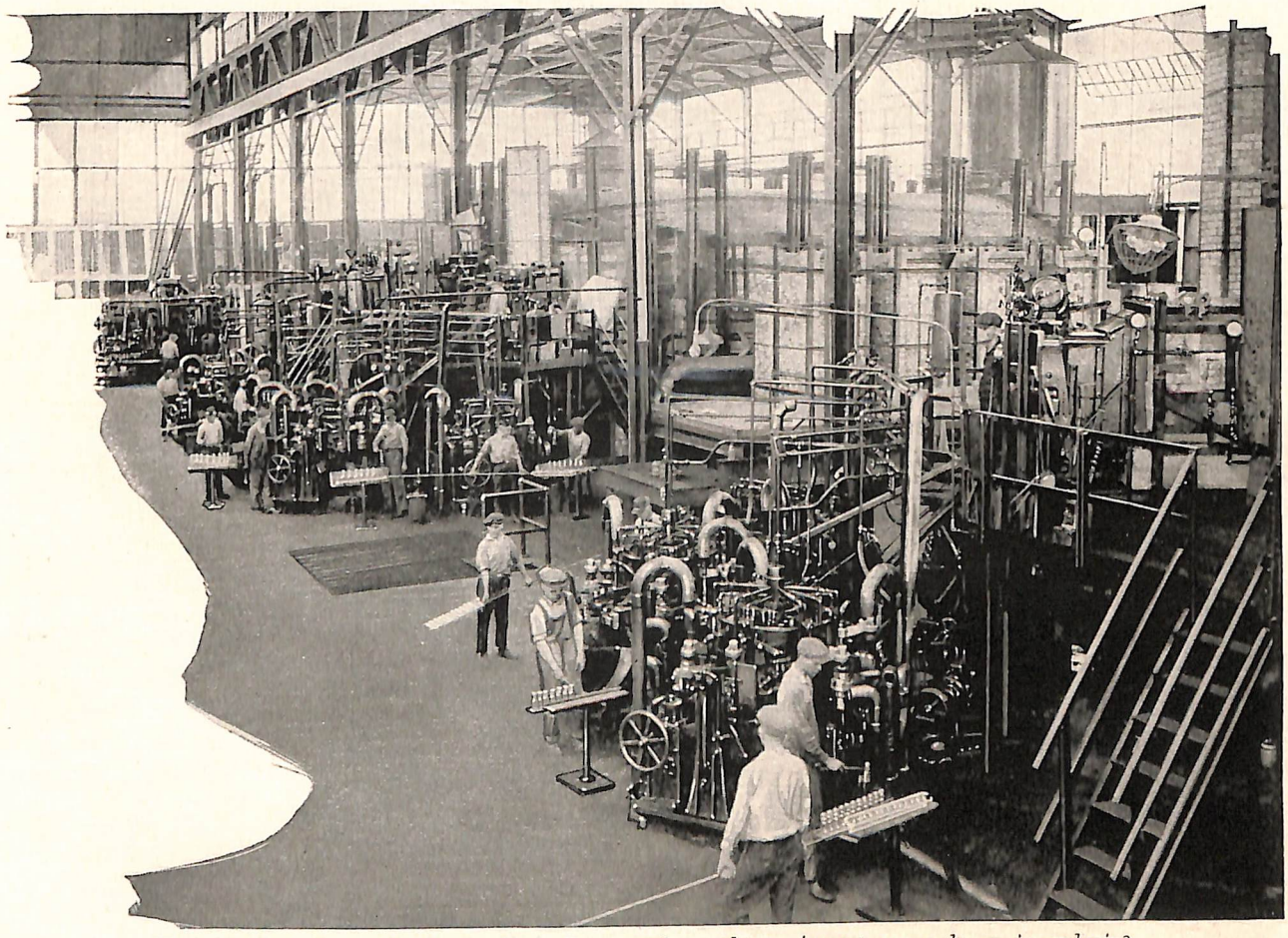
In 1920—just ten years after our installation of the first machine—in order to maintain our place of leadership in the bottle industry, we added another completely new type of Automatic Machine to overcome certain license restrictions which hampered us in the operation of the original.

In this way, we again made good the slogan of our hand blown days—"Bottles of Every Description"—and, at the present time, on either one or the other of our two types of Automatic Bottle Machines, we can make any type of blown container, with the exception of milk bottles and



The two types of machines that have revolutionized the Bottle Industry in the last 15 years.

To the left is shown the "Gob" Feed Machine with Feeder above. Directly below, is illustrated the "Vacuum" type of Machine.



This interior of our Bridgeton, N. J., Factory shows the equipment you rely on in ordering "Diamond I" Bottles.

fruit jars. This gives us the broadest scope of any company in the glass container field.

THE MACHINE OPERATION

THE two types of Automatic Machines that we operate are totally different in appearance and construction, though the processes are quite similar after the glass has once reached the blank mold. The main difference lies in the method of gathering the glass, or of getting it out of the furnace and into the machine.

In one machine a "Vacuum" system is employed to suck the glass into the blank mold. In the other, "Gobs" of glass slide by gravity down a trough system from a feeder attached to the furnace into the blank molds of the machines below. In the first instance, the machine is taken to the glass—in the second, the glass is taken to the machine. Both "Vacuum" and "Gob" Feed Machines rotate while operating—the first continuously and the second intermittently.

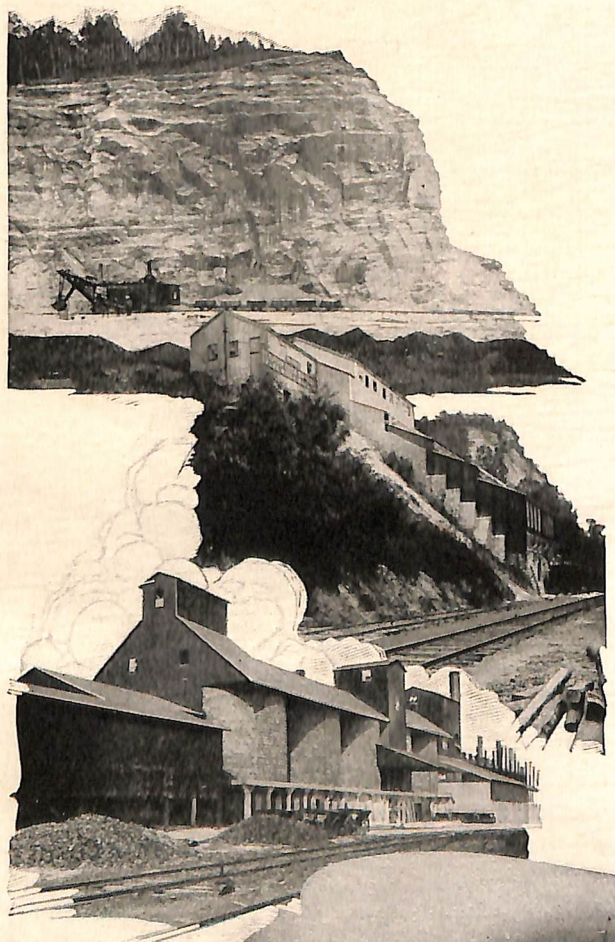
Now let us take the "Vacuum" type of Machine and briefly describe what happens when a bottle is blown. After the glass is sucked up into the measuring blank, a metal tip is lowered which forms the "neck opening" or "finish." Then the blank mold gradually opens while the cylinder of glass is held firmly at the top by the neck ring device. The finishing mold slowly lifts up and closes on the white hot glass. Air is automatically admitted through the neck tip mechanism and the body of the bottle is blown.

This machine is made in various sizes—with six, ten or fifteen arms. The arms are all exactly alike, and each one is really a complete bottle blowing machine. A ten-arm Automatic when working on small ware will make a revolution in ten seconds. In blowing gallon bottles, it turns more slowly, making a revolution in about forty seconds. In the operation of our huge Carboy Machine, which is the largest bottle blowing machine in the world, standing twenty feet high

and weighing over 240,000 pounds, a minute is required for each revolution.

It is apparent from this that the rate of speed at which these machines operate depends largely on the size of ware they are making. Such then is the equipment required today in the Modern Bottle Factory.

At the beginning of this century, Bottle Making was a hand blown process, fundamentally the same in principle and practice as it was three or four thousand years ago. In less than twenty-five years it has changed from a skilled craft into a scientific industry.



From the Sand Quarry and Mill to the molten glass is a long journey—but we control each step along the right of way in the production of bottles. The building with the large circular bins is one of our Batch Plants.

THE COMMON INGREDIENTS OF GLASS

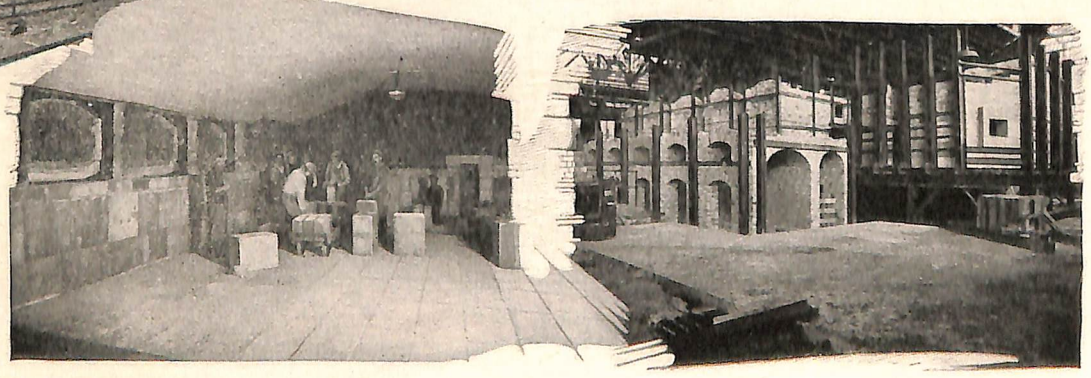
GLASS, the substance itself, however, is the same as of old. Only the equipment and methods of working it have changed. When sand, lime and soda ash, three common opaque substances, are mixed together in the proper proportions and subjected to intense heat, a transformation occurs. From their intermingling and fusion comes a new and wonderful product, clear and transparent.

These principal ingredients of glass, with the addition of the proper chemicals, are stored in large circular bins in what is known as the Batch Plant. The quality of the glass depends in no small measure upon properly proportioning and thoroughly mixing these materials.

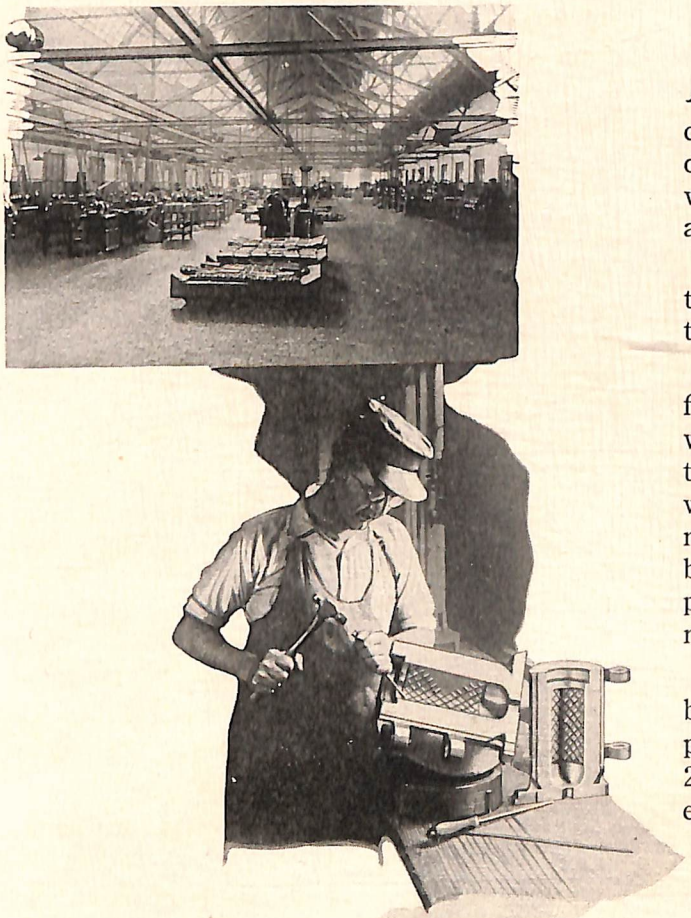
Formerly this work was done by hand in a somewhat haphazard manner, the mixing being accomplished by turning the batch over and over on the floor with shovels, after which it was hauled to the furnace in cars drawn by horses.

In the Twentieth Century, even in mixing the batch, machinery has been built to give absolute accuracy of proportion as well as uniform and perfect mixing.

At our various factories, all of which use the same general type of Batch Plant, electrically operated cars collect the proper quantity of each material and dump it into automatic mixing machines. From here it is conveyed to a loading bin over head, from which the batch is drawn by gravity into other cars and transported over elevated tracks to the furnaces.



To the right are photographs showing the process of furnace construction.



FURNACE CONSTRUCTION

A MODERN furnace is as big as a good sized house and is of more costly and complicated construction than is generally realized. It is designed to meet the special conditions under which it operates and to produce a maximum amount of glass with a minimum amount of fuel.

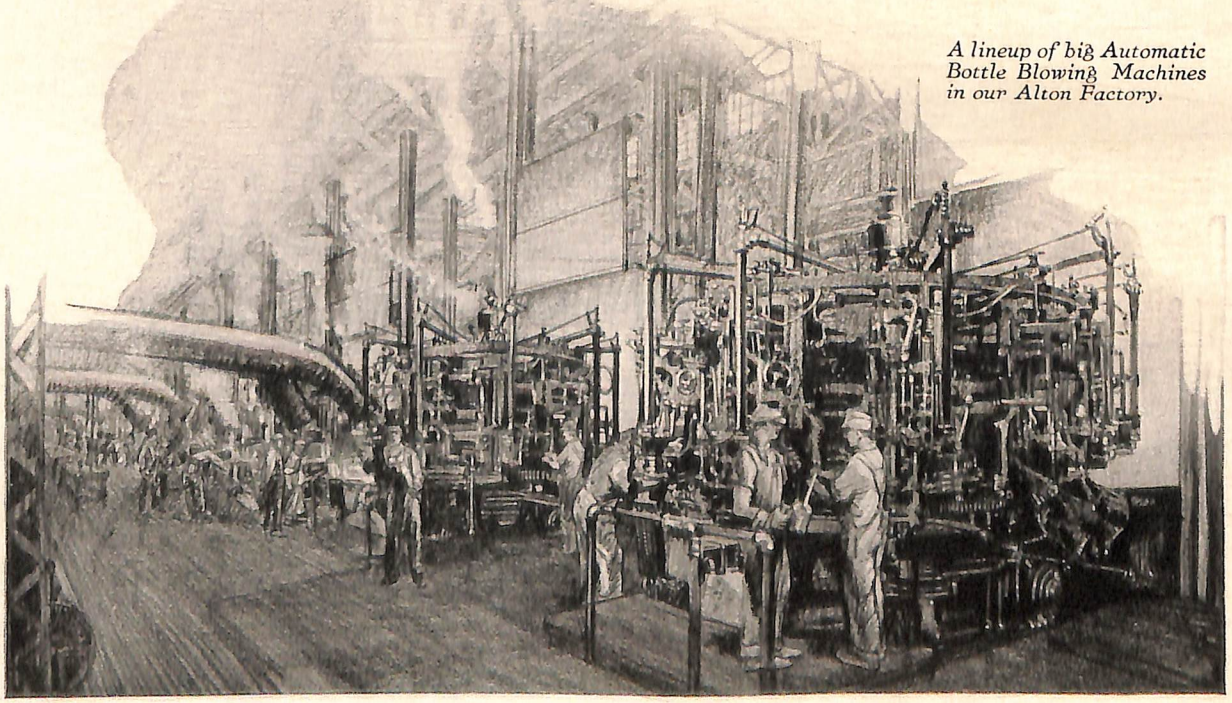
The average furnace holds approximately 250 tons of molten glass and will produce about 35 tons of finished product every twenty-four hours.

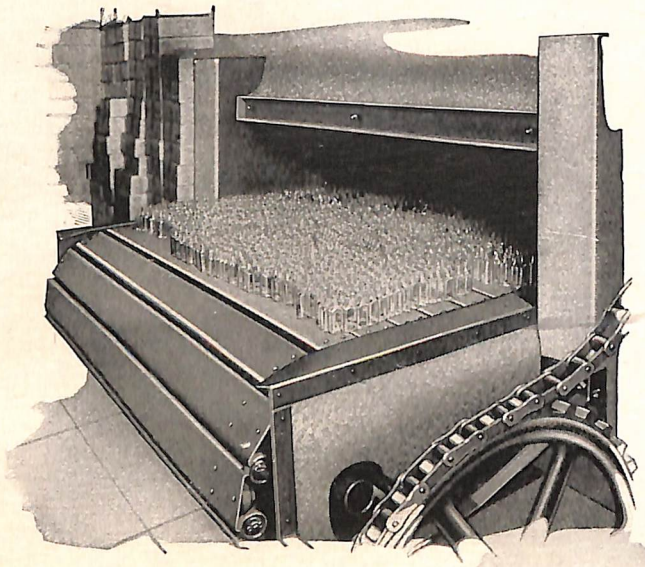
The life of a furnace is only from twelve to fifteen months due to the corrosive action on its walls of the molten glass. The foundations of these tanks are usually of concrete and steel, while its accessories and the furnace proper are made of very high grade fire clay blocks and bricks, some of which weigh as much as 1,800 pounds each, and require about six months to manufacture.

When a furnace is rebuilt or repaired, it has to be heated very gradually from atmospheric temperature to the working temperature of about 2,700 degrees Fahrenheit in order to keep the expansion it undergoes from bursting it. Heat is

Above—an interior view of our Bridgeton Mold shop. With over 3,000 different stock models and sizes of bottles, not to mention the endless variety of special and private mold ware, large shops are kept busy all the time on the mold equipment required.

A lineup of big Automatic Bottle Blowing Machines in our Alton Factory.







The lehr at the top shows the way Bottles emerge at the Packing and Inspection Room. To the right—girls packing Bottles. Below—loading a car of 5-Gallon Bottles in Full Height Crates. Proper tempering and packing are important steps in a successful bottle service.

applied over the top of the glass rather than under it, as is the usual case where materials are to be heated or cooked.

The furnace proper is divided into two chambers or compartments—the Melter and the Refiner—which are connected by a small port or Thimble that allows the good glass to pass over to the refining end, while the slag floats and remains in the melting chamber.

EXPENSIVE MOLD EQUIPMENT REQUIRED

EVEN the mold equipment for the Automatic Machines presents a much more serious problem than it did in the old hand blown days when one mold was sufficient to take care of an order. The glass makers' field is not limited exclusively to his manipulations of glass by any means. It requires a good deal of contact and work with that still harder substance—iron.

For instance, each arm of the "Vacuum" type machine requires no less than nine separate and distinct parts machined to the one thousandth part of an inch from rough castings. Multiply this equipment by ten and you have ninety mold parts all carefully ground and finished, that have to be turned out before a ten-arm machine can start operation. In addition to this, there are something like fifty-eight duplicate or emergency parts—or 148 separate parts in all that have to be made before a bottle can be blown.

THE IMPORTANCE OF ANNEALING

THE same care and exactness which characterize the other steps in the manufacture of "Diamond I" Bottles also obtains in the tempering. This process is very important in the production of quality ware. It must always be watched closely and never hurried.

The purpose of annealing or tempering glass is simply to eliminate as far as possible the stresses



and strains that develop during cooling. After a bottle is taken from the machine and put in the lehr it is cooled very gradually. When the outer surface cools faster than the glass of the interior wall, uneven contraction builds up stresses and strains that tend to weaken the bottle. The idea of annealing is to allow a molecular readjustment that will eliminate as far as possible the strains of uneven contraction.

As the bottles pass through these seventy-foot tempering ovens, the heat is gradually tapered off from about 1,100° Fahrenheit at the point of entrance to the temperature of the inspection and packing room where they finally emerge properly annealed, strong and cool.

The floor of the lehr is a wide continuous iron belt operated by electric motors and gear wheels. These conveyors are adjustable and can be set to operate at different speeds, depending on the size and style of bottles to be tempered. The average time required for a bottle to pass through ranges from six to eight hours.

PACKING IMPROVEMENTS AND CHANGES

IN the old days a bottle was considered merely a convenient means of handling and packing various products. Such features as exact capacity, special finish, color, packing, weight, corkage, etc., were given slight, if any, attention. So long as the bottles did not have more than one hole in them—and that in the neck—they were considered all that should be expected.

Soda water bottles were often packed in jute sacks, and strange as it may seem, carried very well as they are naturally strong and heavy. Nothing was known about modern packing methods, and all sorts of odd sizes and styles of boxes and crates were used in packing a shipment.

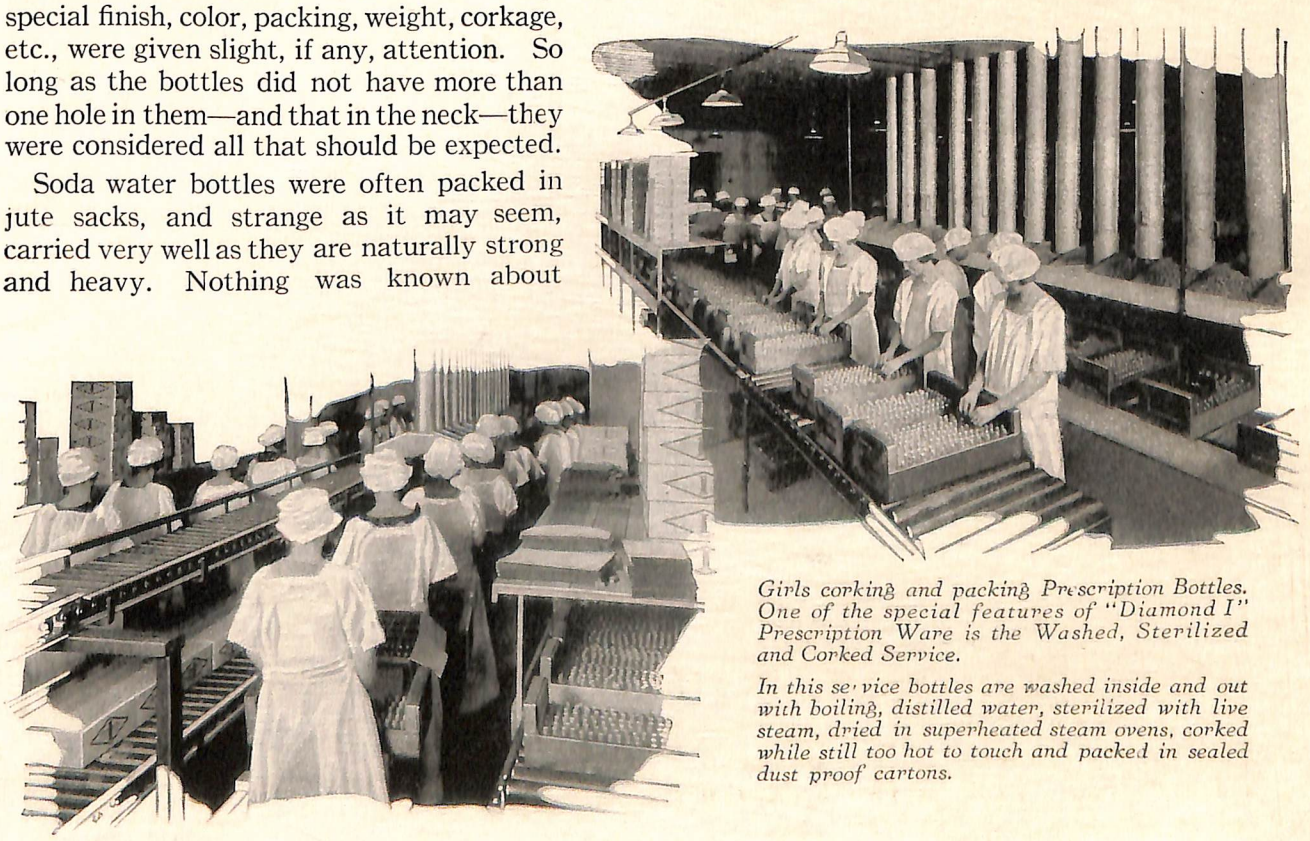
Today, however, the story is quite different. Modern methods and mechanical processes, both in the manufacture of the bottle and in the bottling room of the user, call for greater care, uniformity and exactness in every direction than was formerly necessary.

The Illinois Glass Company has long been a leader in the bottle industry, and has played no small role in bringing about this change. Early seeing how essential good packing was to the safe delivery of ware to the customer after it was once made, we established and equipped large departments to look after the packing phase of our service.

ARRANGING THE PRODUCTION SCHEDULE

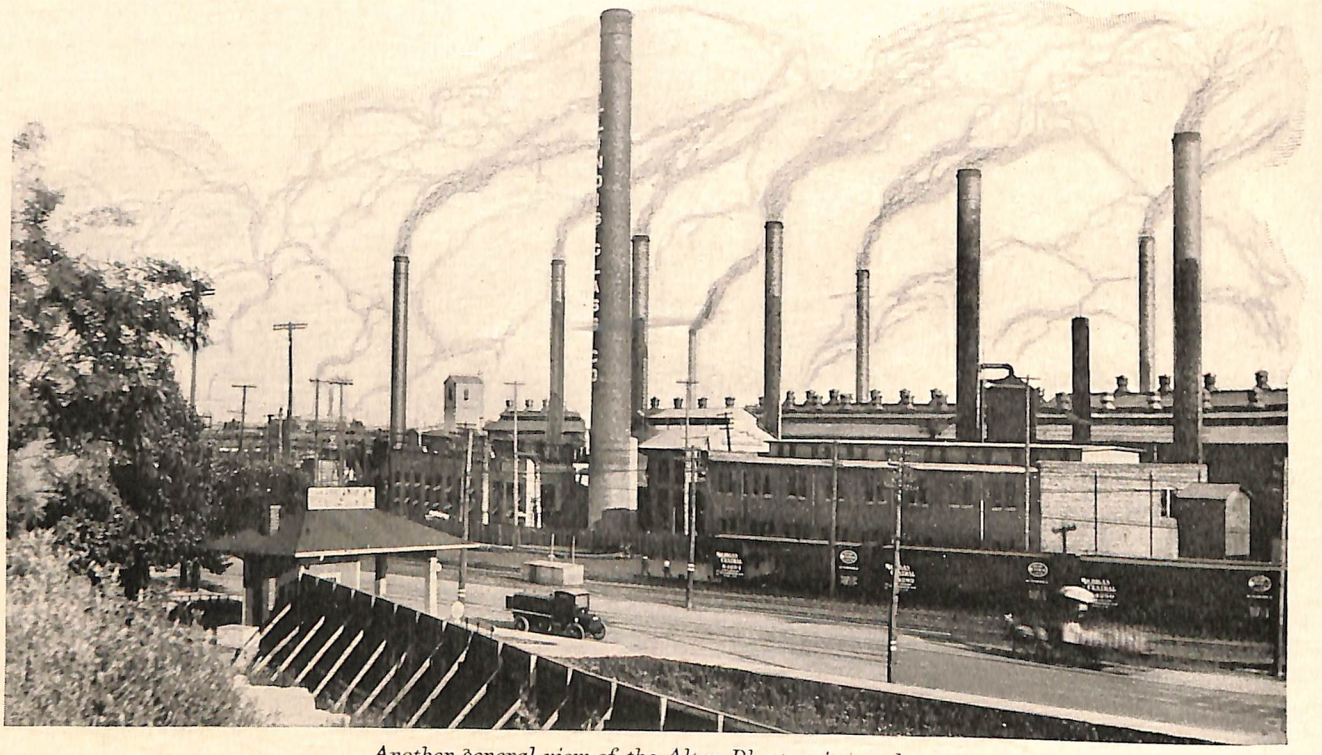
WITH the huge output of bottles leaving our factories, it is necessary to have the various steps in their production and shipment well in hand.

A schedule is prepared early each week outlining the production of the Machines for the following week. This schedule is very brief, giving the number of the machine, dates, the kinds and sizes



Girls corking and packing Prescription Bottles. One of the special features of "Diamond I" Prescription Ware is the Washed, Sterilized and Corked Service.

In this service bottles are washed inside and out with boiling, distilled water, sterilized with live steam, dried in superheated steam ovens, corked while still too hot to touch and packed in sealed dust proof cartons.



Another general view of the Alton Plant as it is today.

of bottles to be produced and the normal run. This information is then sent to the heads of the operating departments who work out the schedules for their departments accordingly.

The manager of the Mixing Plant knows what raw materials he must have ready to feed the furnaces. The manager of the Mold Shop goes over the molds that will be required for the week's work to see that they are all in perfect condition. The Packing Department knows how much ware it has to handle, and at what time each class of bottles must be packed.

The Box Department arranges to start the right lumber through the machines at the proper time so that the required kind, number, and sizes of boxes will be ready for the packing department when the ware for those boxes is ready for handling. And as each size of box and bottle requires paper, strawboard, or corrugated board packing, cut to exactly the right sizes, this is made ready.

The Shipping Department knows in advance exactly how many packages of a given size, volume and weight it will have to forward to customers on certain dates. The Traffic Department knows how many freight cars will be required. There is no guesswork. Every step in the week's operation is outlined with the accuracy of a plan of battle or the schedule of a railroad system.

THE MEANING OF "DIAMOND I" SERVICE

TO GIVE our customers the best bottles and the best service possible has always been our aim. During the war, when the Government needed a large part of our capacity, and during the boom years that followed, this was no easy matter. We experienced the universal difficulty of trying to make a limited production, large as it was, take care of an apparently unlimited demand.

The one thought we permitted to govern our actions during that period was to divide and distribute the capacity of our plants as justly and equitably as possible among those customers who for years had looked to us for their bottle needs. They were our first consideration, and so far as our resources permitted, they never suffered through lack of co-operation from us.

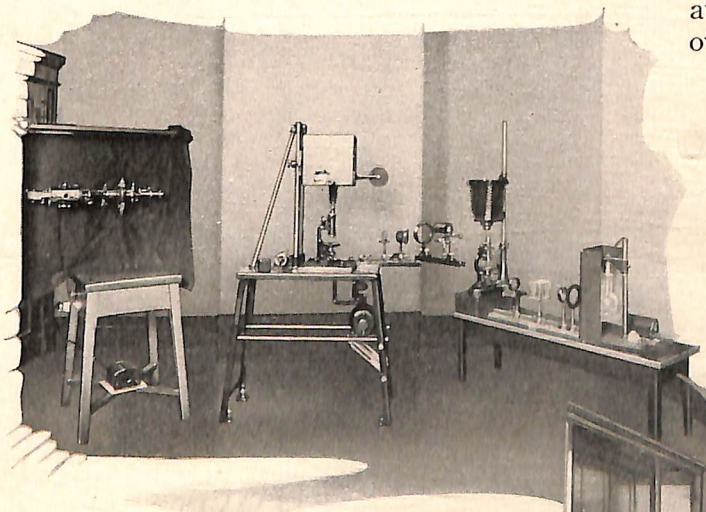
That our duty to the Government was well performed has been acknowledged in Citations

and Emblems from the War Department at Washington. A Citation from the Surgeon General of the army reads as follows:

"In supplying millions of bottles to the Medical Department during the period from April, 1917, to November, 1918, the Illinois Glass Company rendered very valuable service to their country. Their output was enormous and had it not been for the loyal co-operation of this company, the shortage of prescription bottles might have been serious."

At various times in the past the glass industry has been criticised for its backwardness. These attacks, however, are no longer well founded, for at the present time it is a very modern, up-to-date industry.

Not so long ago a well known writer made the statement that what was now needed most was a closer co-operation between the analytical chemist and the practical glass manufacturer. As far as we are concerned, however, this criticism has no point for we have a laboratory in Alton devoted to experiments in glass chemistry and technology which probably has no equal in this country outside of the one maintained by the Bureau of Standards at Washington, D. C.



Here in our scientific Research Laboratory at Alton are delicate and intricate mechanisms of every description used in the study of glass. The chemists and scientists in charge have an enviable reputation both in this country and abroad.

We are awake to the fact that future developments and progress in improving the quality of "Diamond I" glass must come very largely through a closer correlation of the known principles of chemistry and physics with the practical skill and ingenuity of our Manufacturing Department.

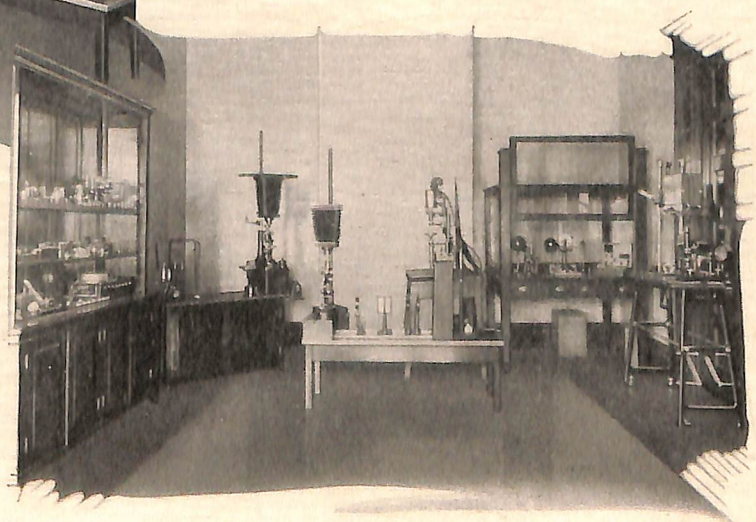
GROWING POPULARITY OF THE GLASS CONTAINER

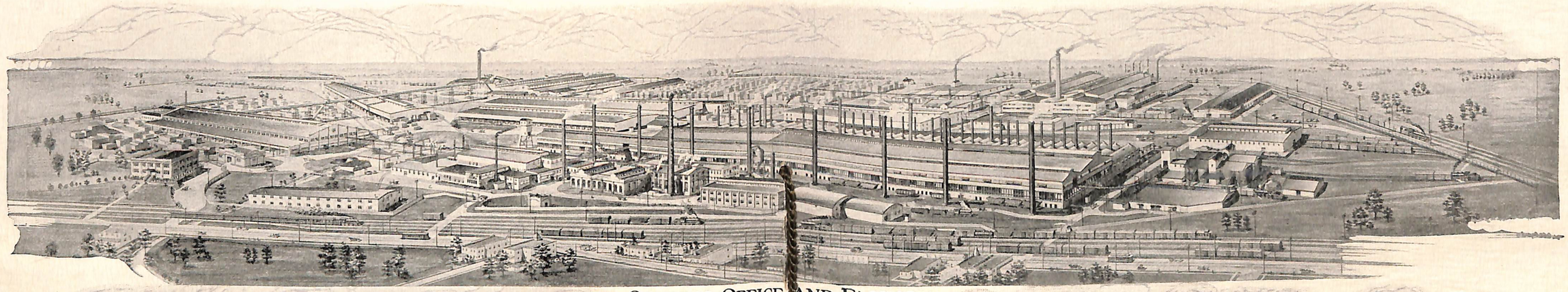
AND back of it all stands what? The ideal of service. Every one of our fifty years in business has been a record of progress and achievement. We started out in a very humble way and have grown and expanded until our factories extend from coast to coast and our branch sales offices are found in all principal cities.

The clean, sanitary, transparent glass container is coming into its own as a quality package. Of late years the growing emphasis on public hygiene, pure foods and sanitation have thrown more and more attention in its direction.

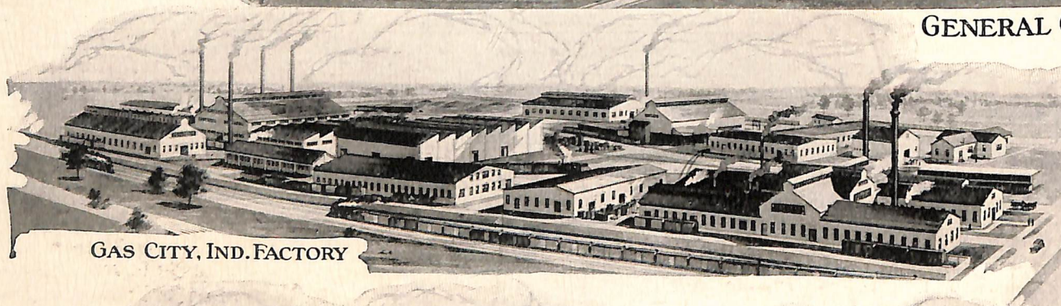
Although we have eternally kept before us the highest possible conception of what a practical bottle service could be made to mean, we do not attribute our success in this line entirely to our own efforts.

The glass container is one of those products with such inherent merit that all it needs is an introduction. Its popularity increases with use. We have been catering, therefore, to a demand that has developed and broadened in scope as the peculiar advantages and unique characteristics of the glass package became more generally known.

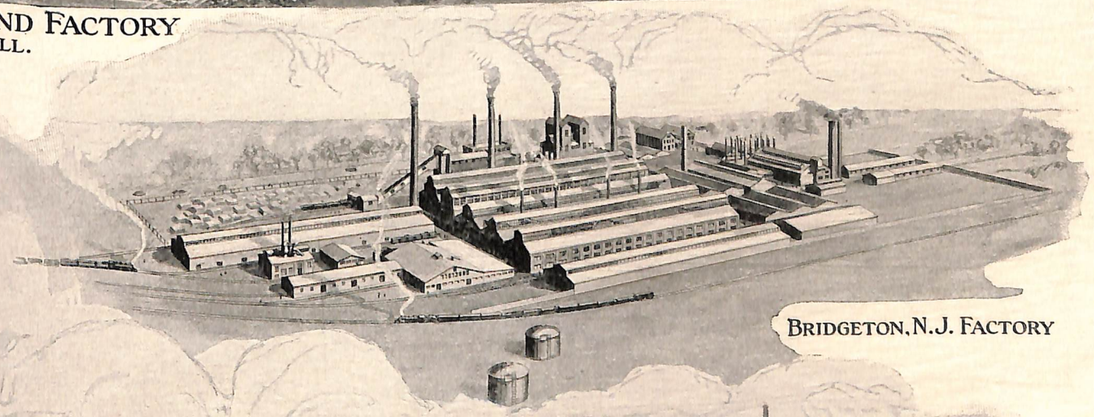




GENERAL OFFICE AND FACTORY
ALTON, ILL.



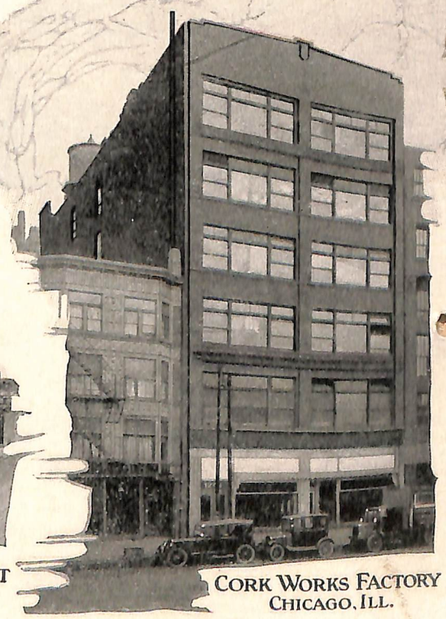
GAS CITY, IND. FACTORY



BRIDGETON, N.J. FACTORY



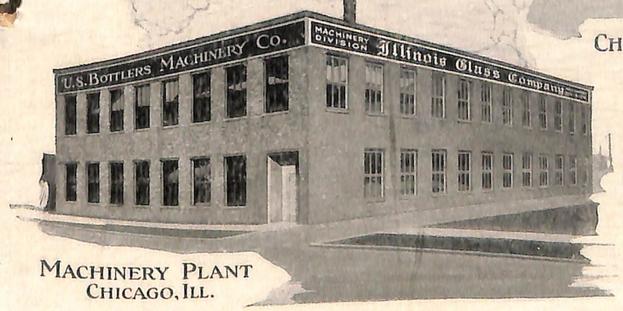
CHICAGO HEIGHTS, ILL.
PLANT



CORK WORKS FACTORY
CHICAGO, ILL.



CARTON & LABEL PLANT
CHICAGO, ILL.



MACHINERY PLANT
CHICAGO, ILL.



CHEMICAL GLASSWARE FACTORY
VINELAND, N.J.

PLANTS and Factories of the Illinois Glass Company.

CORRUGATED DIVISION

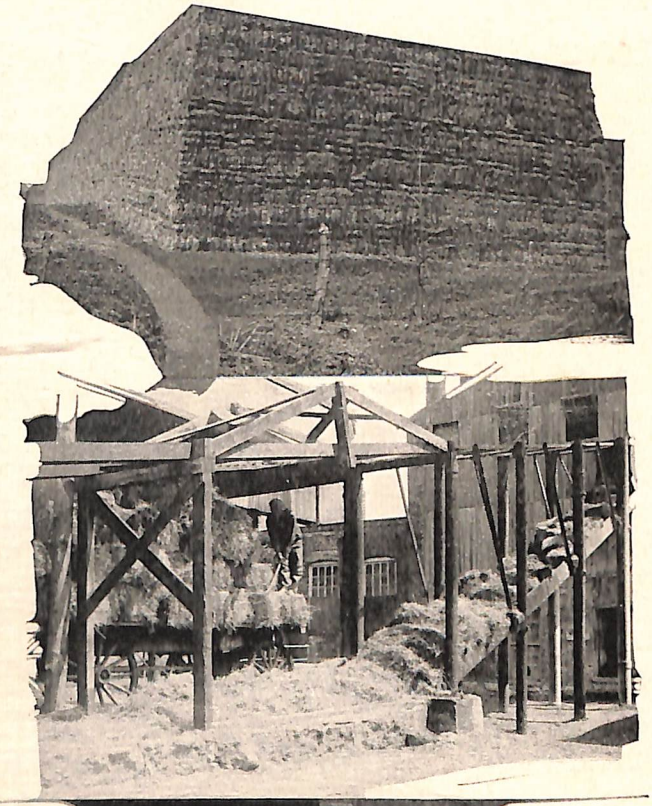
THE Corrugated Fibre Industry, unlike the Glass Bottle Industry, is very recent in origin. Instead of going back 3,500 years or more it goes back less than thirty-five years.

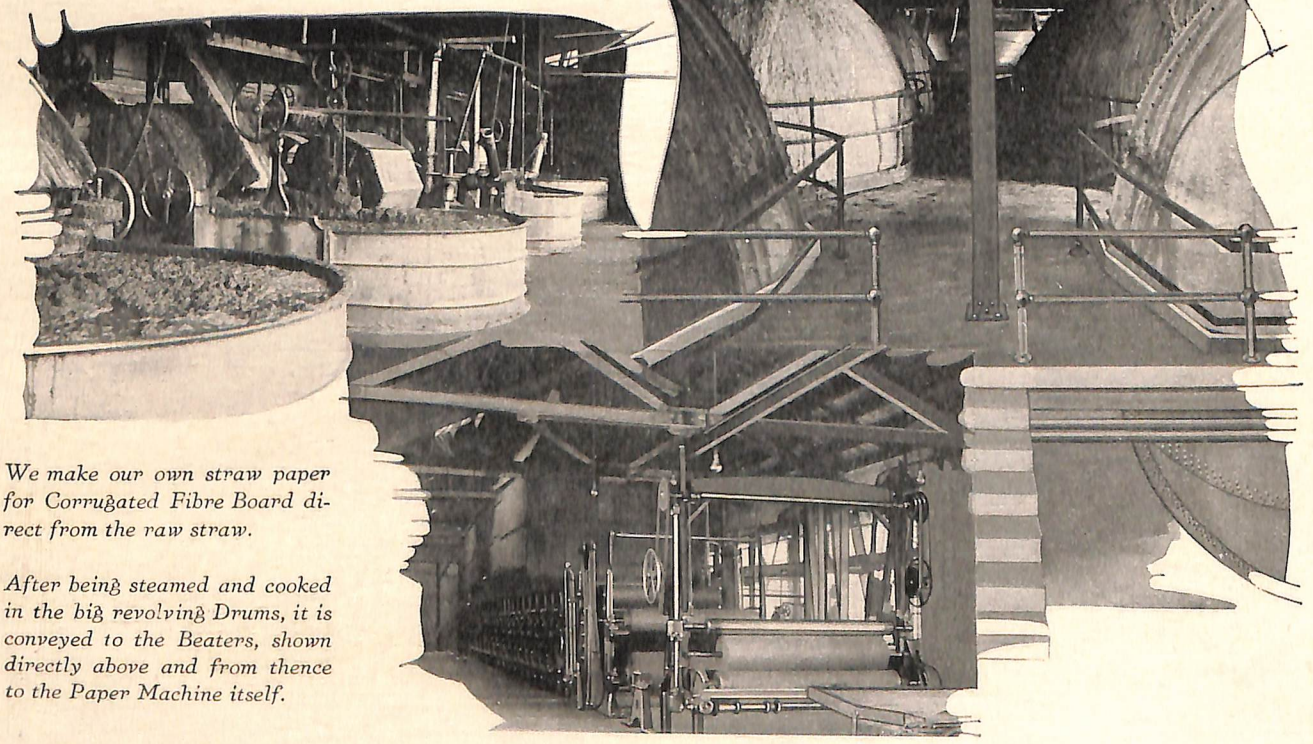
Glassware, naturally, must be well packed to arrive at its destination in good condition. Our Corrugated Division, therefore, since its inception has played a very important role in our efforts to build up a Better Bottle Service.

Although the first patents for the manufacture of Corrugated Paper were taken out in 1871, its use for several years thereafter was confined entirely to interior packing. Later on, the idea was conceived of applying one facing sheet and then two—and Corrugated Single Face and Double Face Board resulted.

In the late Nineties the first Corrugated Fibre Boxes came into use. They were restricted to city delivery and express shipment and had no very enviable standing with the Railroads as shipping containers.

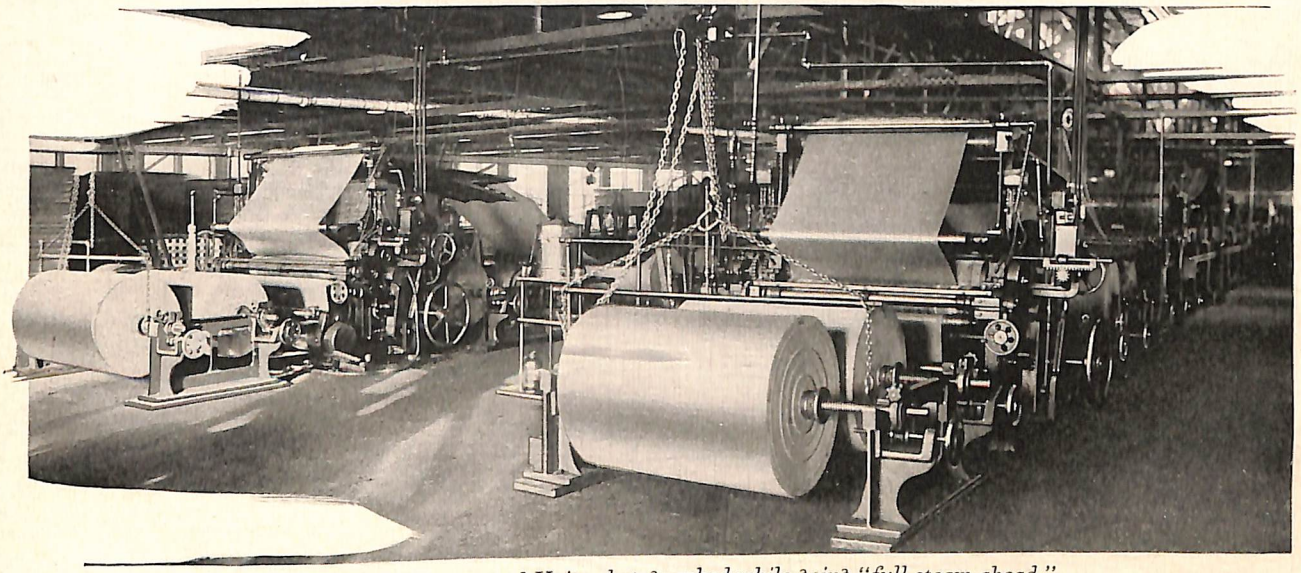
In 1901, it became apparent to the Directing Heads of the Illinois Glass Company that the large amount of Corrugated Paper and packing which we were using in connection with our shipments of bottles, would justify our becoming a producer as well as a consumer.





We make our own straw paper for Corrugated Fibre Board direct from the raw straw.

After being steamed and cooked in the big revolving Drums, it is conveyed to the Beaters, shown directly above and from thence to the Paper Machine itself.



A couple of our Corrugated Units photographed while going "full steam ahead."

Since that time large sums of money and a great deal of effort have been spent in the development of this important branch of our business. As the demand for this new type of shipping package grew, we carried our production facilities still further back and established a paper mill for making paper from the raw straw.

Although this Corrugated Division was originally intended only to take care of our own needs, it grew so rapidly, we were soon prepared to furnish, independent of bottles, practically everything in this line of manufacture. Today, in addition to Corrugated Fibre Boxes of all kinds, we manufacture Bottle Wrappers, Cartons, Shells, Fillers, Circles, Pads and Liners.

Our Reshipping Case Service is an example of what we have done in this field to save our customers time and money. In this service bottles are packed and shipped in Corrugated Fibre Cases all ready for reshipment to the trade.

These boxes, printed or plain, are sealed at the bottom, filled with bottles and loaded into cars. Upon their receipt, therefore, it is a comparatively simple process to remove the bottles, fill them, put them back in the Corrugated Cases, seal the tops and mark them for shipment.

In the Corrugated Fibre Industry, the same as in the field of Machine Made Bottles, the Illinois Glass Company has been a pioneer. We have seen such crude materials for packing as straw, hay, sawdust and shavings give way before that better product—Corrugated Paper—and have been glad to help in its introduction.



An exterior of our Corrugated Fibre Plant at Alton.

Wood Box Division

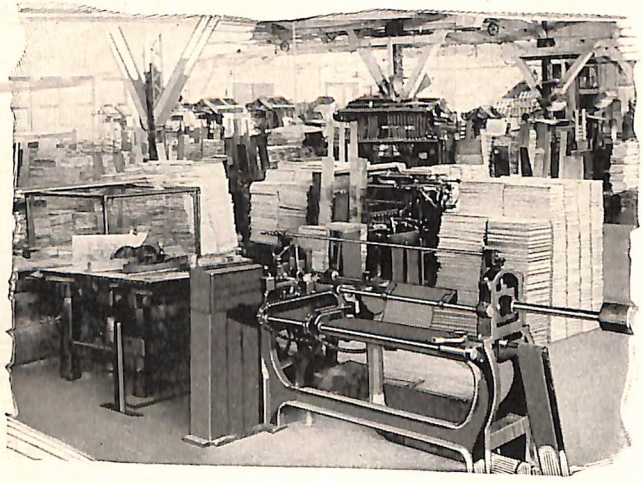
IT is quite evident that after bottles are made they must be shipped—and long before corrugated boxes were ever thought of as shipping containers, the Wood Box was the supreme and acknowledged leader in its field without competition of any kind.

Early in our career we decided we could improve our service a great deal if we had our own Wood Box Factory, in which the various Wood Crates, Packing Boxes, and Reshipping Cases, needed in the transportation of bottles could be manufactured.

Although today, we convert into boxes and crates over twenty-five million feet of lumber a year, the entire output is required for our own use. We keep large stocks on hand of Gum, Cotton Wood and Pine, in addition to box lumber of all kinds. Only the best lumber obtainable in the grades that we use is bought, and we have an inspection force in the field the year round to assure us of getting the best part of the grade and not what is left.

The range of boxes we make includes lock cornered, nailed, nail cleated and other special types and styles. We have done a great deal to get our customers to realize the important savings and advantages that may be obtained in ordering their ware packed in Wood Reshipping Cases, printed and manufactured according to their specifications.

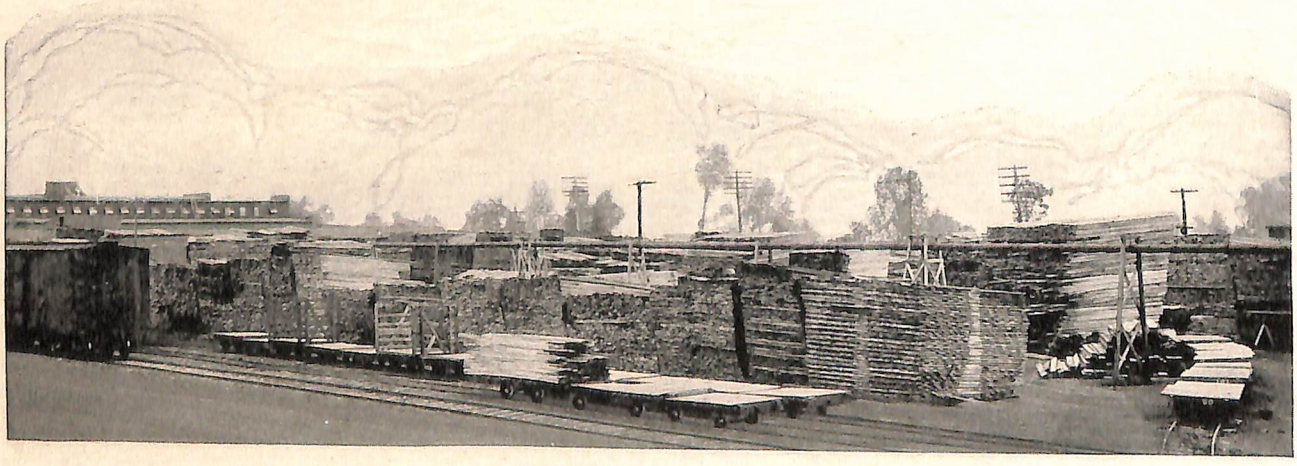
Our line of Carboy Wood Packages is the largest and most complete on the market, and on many of these we possess exclusive manufacturing rights. City Delivery and Shipping Cases for Soda Bottles constitutes another line in which we specialize. We build soda bottle cases for the



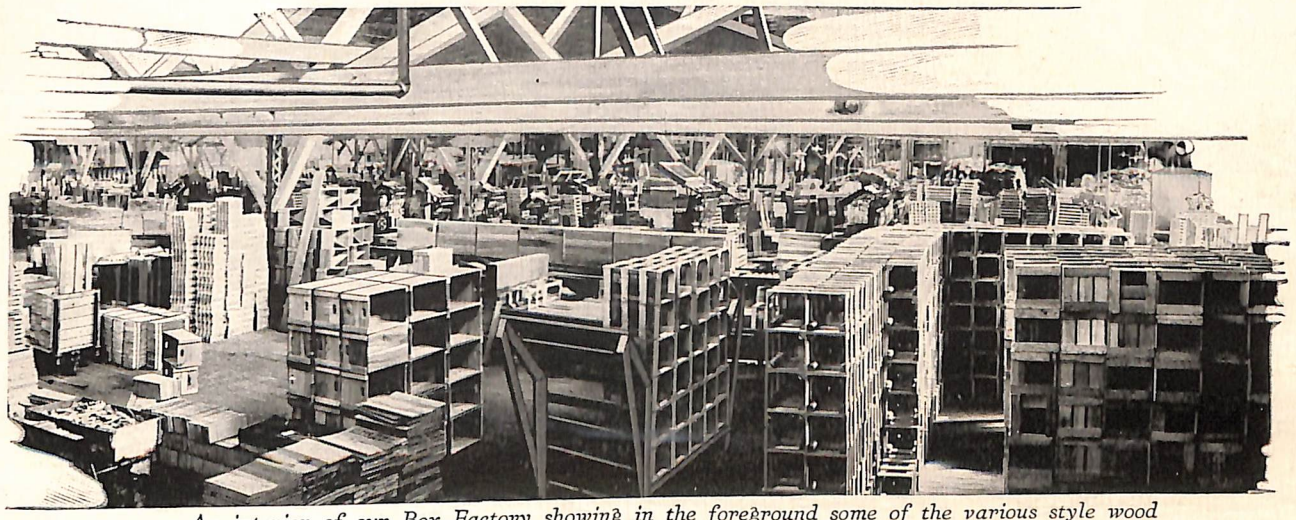
Modern machinery has reduced box making to a science.

customer, fill them with his bottles and ship them together—a service which reduces breakage to the minimum and saves freight, time, trouble and money.

We have learned from experience that it is better to be safe than sorry, and for that reason have always made our shipping packages stronger and more substantial than required by railroad specifications.



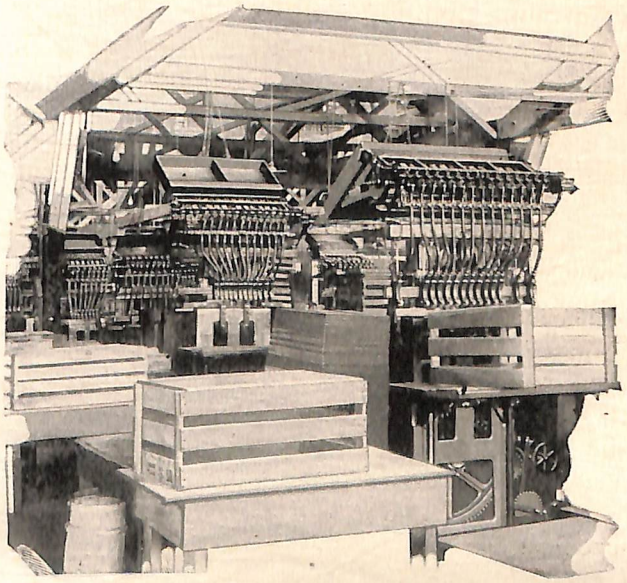
Millions of feet of lumber are kept on hand at all times.



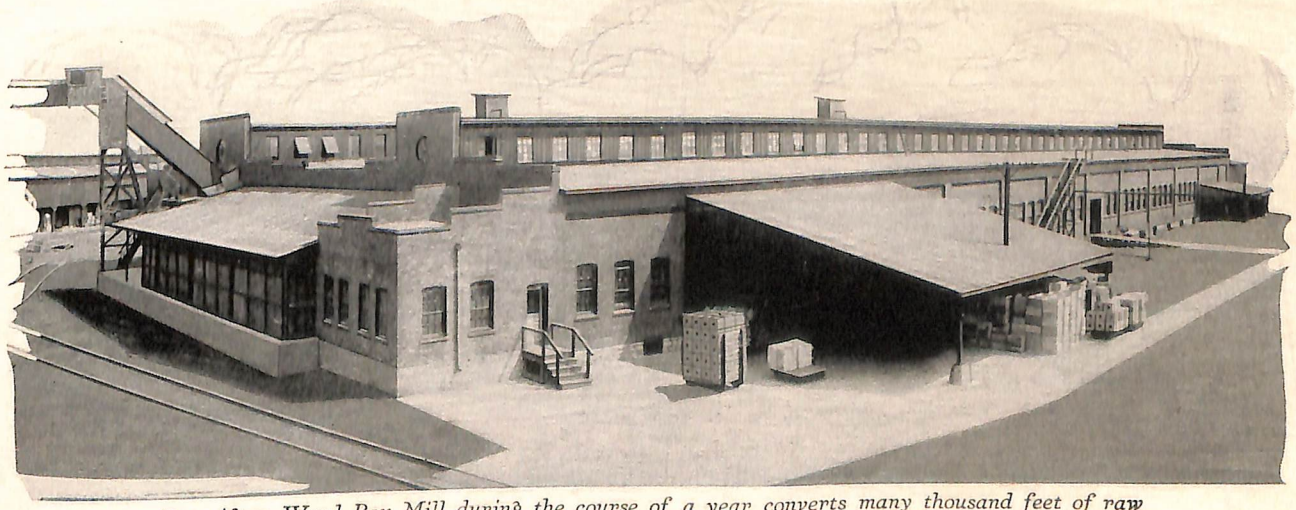
An interior of our Box Factory showing in the foreground some of the various style wood packages we make.

The standard specifications require only three nails in each end of a single strip on a crate, but we make it a practice to put in four. Again, we never substitute a cheaper grade of lumber in a box than the stock called for. If there is any substituting to be done it is always up—into a better grade. Along this same line it might be mentioned that the thickness of lumber specified is the exact thickness of lumber delivered.

With the rough handling of shipments in modern transportation merchandise must be properly protected and we would rather go over the standard specifications and requirements of the carriers and safeguard our customers and ourselves, than to go under, and run the risk of breakage in transit.



A battery of nailing machines that talk "brass tacks."



Our Alton Wood Box Mill during the course of a year converts many thousand feet of raw lumber into bottle boxes and crates.

CARTON *and* LABEL DIVISION

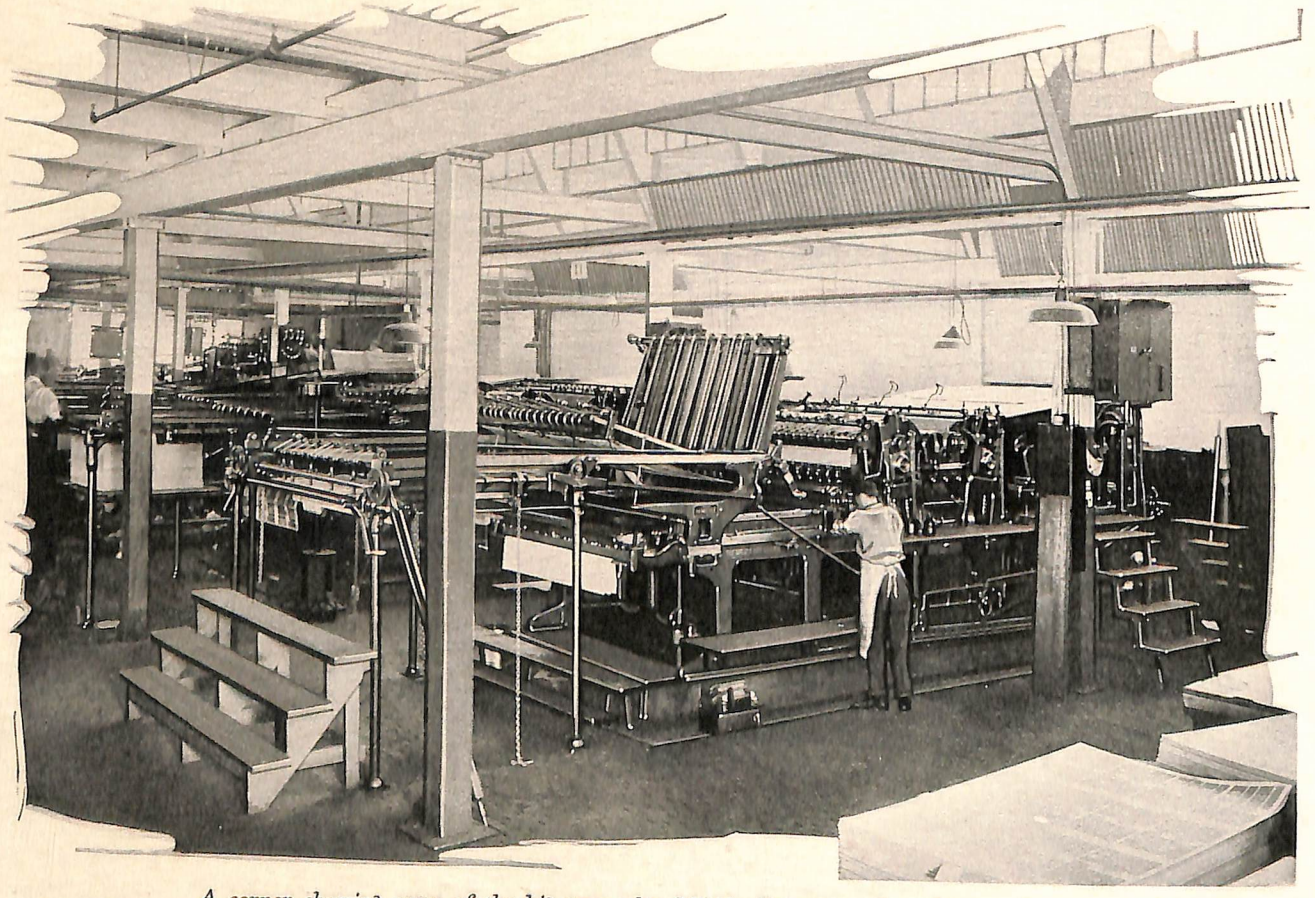
THE present has aptly been said to be a "Package Age" — bulk goods having given way to the new idea of convenient quantities in individual cartons. When one stops to consider the hygienic, sanitary, clean and attractive carton container, there is little wonder that it dominates the market today and receives so much attention.

The day of the scoop, the open bin and the uncovered barrel in the corner grocery is a thing of the past. In this age of keen competition every manufacturer is trying to individualize his product—trying to differentiate it from the rest. And what more natural way of doing this than with the package—the Carton and Label?

In nearly every line of business, new sources of application for the Carton and Label are being opened up. One needs only to look around to see the many new ways in which packages are being used. Among other things, the Carton, eliminates the chance of substitutes—guaranteeing the buyer that he is receiving the goods of the particular manufacturer he has in mind. It increases selling power and ease of handling. The distinctive paper box gives life and expression to what might otherwise be just one of many articles all alike, which suffer the disadvantages of bulk goods.

In placing a package on the market a manufacturer has many problems to consider. For instance, he must take into consideration art, design, size, shape, strength, color, simplicity and to whom it is going to appeal—men or women.

To look at packages in the light of their wide application makes them a great deal more than



A corner showing some of the big two color Miehle Presses used in the printing of "Diamond I" Cartons and Labels.



Modern construction and every device and convenience for handling stock and keeping a smooth, even flow of production are found here.

just so much paper board and printer's ink. To try and incorporate into them the possibilities of design, advertising and selling power makes an unlimited field for development.

Located advantageously in a Northwest side manufacturing center of Chicago is our large, modern, up-to-the-minute Carton and Label Plant, built by us three years ago.

The Carton & Label Division of the Illinois Glass Company did not grow up over night any more than our bottle business did. It started out years ago as a little, job press label printing establishment which it continued to be almost up to the time of the World War.

Then as the inquiries for Cartons and Labels were being constantly received in connection with our bottle orders, we decided that the time for us to add to our facilities in this line had arrived.

We, therefore, added some big printing presses, cutting and gluing machines and took over two floors in a building just north of the Loop in Chicago. In this move, we added the Folding Paper Carton to the list of products of our manufacture.

Although, when we moved into these new quarters, we were sure we had room enough for expansion to last us the rest of our lives, what was our surprise to find, before the close of the War, that we had outgrown our two floors and were as cramped for space as though confined in a straight jacket.

Building materials and costs at that time were high, but there was nothing for us to do but build to suit our special needs. This we did, and the present home of the Carton & Label Division is the result.

When we moved into this new building less than three years ago, we thought that we were then fixed ideally for a great many years to come. Already, however, the new shoe is beginning to fit snugly and we are wondering how soon our next step in expansion will have to come.

In this new plant of ours we have contrived to bring together the essentials for making a quality product at the lowest possible cost. The men in charge of our Carton & Label Division are as experienced, competent and expert in their line as our bottle men are in theirs.

For a long time the Illinois Glass Company has watched the swing of the pendulum toward "packaged goods." As the demand for Cartons and Labels grew in connection with the demand for bottles, we added to our facilities to meet it.

Many nationally advertised and familiar bottled products have done their share in spreading the carton idea. Bottles in cartons are individually protected, easier to ship, lend themselves better to window displays in the local dealers' stores, and, all in all, have proved to be a stronger selling unit, times without number.

Many large bottlers who formerly wrapped their bottles have discarded this method in favor of the Folding Paper Package. And, in many instances, it has proved to be a cheaper method of dressing an article than wrapping it by hand.

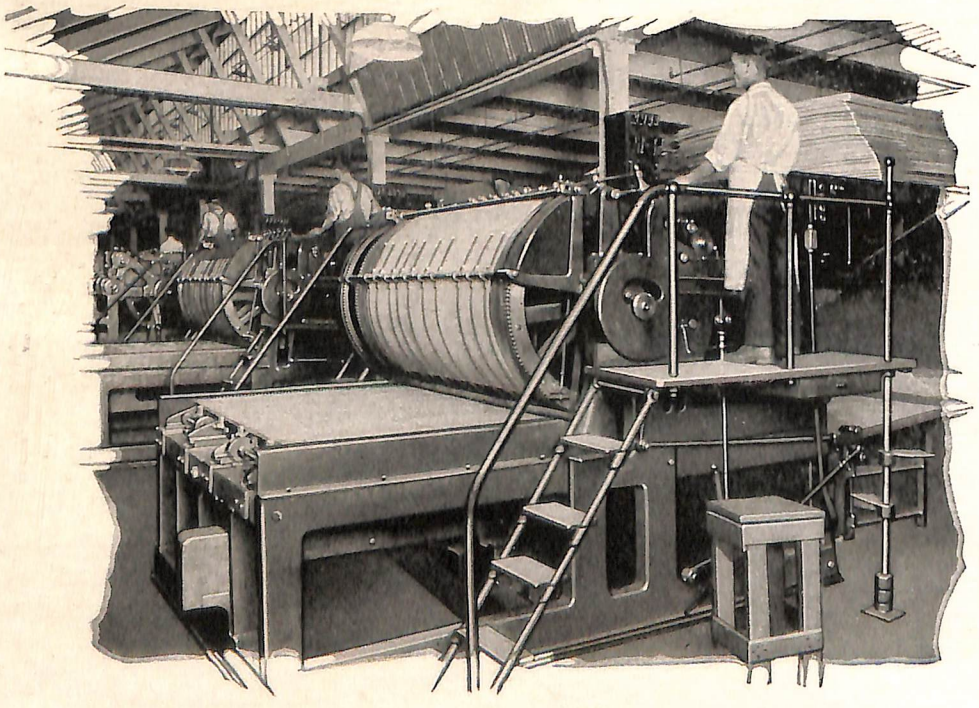
Although a large part of our Carton and Label business naturally enough revolves around our main product—bottles—still there is no attempt to restrict it or confine it to this field. In fact, a large per cent of our total business now is done in manufacturing the packages for products that have nothing to do with bottles.

We are mindful that a good bottle calls for a good label and a good carton; and knowing the common desire to buy from one reliable source wherever possible, instead of from many, we have established this big package division as an important part of our complete service.



The Job Press Room comes in handy for small runs and miscellaneous printing jobs.

Just as the "Diamond I" is something to look for on a bottle, so also, is it a distinctive mark of merit when applied to Cartons and Labels. If past performance counts—the number of nationally advertised products going to market in "Diamond I" Cartons and identified by "Diamond I" Labels, tells its own significant story of success.



Hoe Presses cutting and printing at the same operation. In this Carton Plant we have tried to bring together the essentials for making a quality product at the lowest possible cost.

MACHINERY DIVISION

REVOLUTIONARY as has been the change in the Bottle Industry during the last decade or two, it is scarcely more striking than the development and progress that has occurred in the Filling and Packaging of Bottled Products. In the Bottling Room as well as in the Bottle Factory machinery has come in to supplant hand labor.

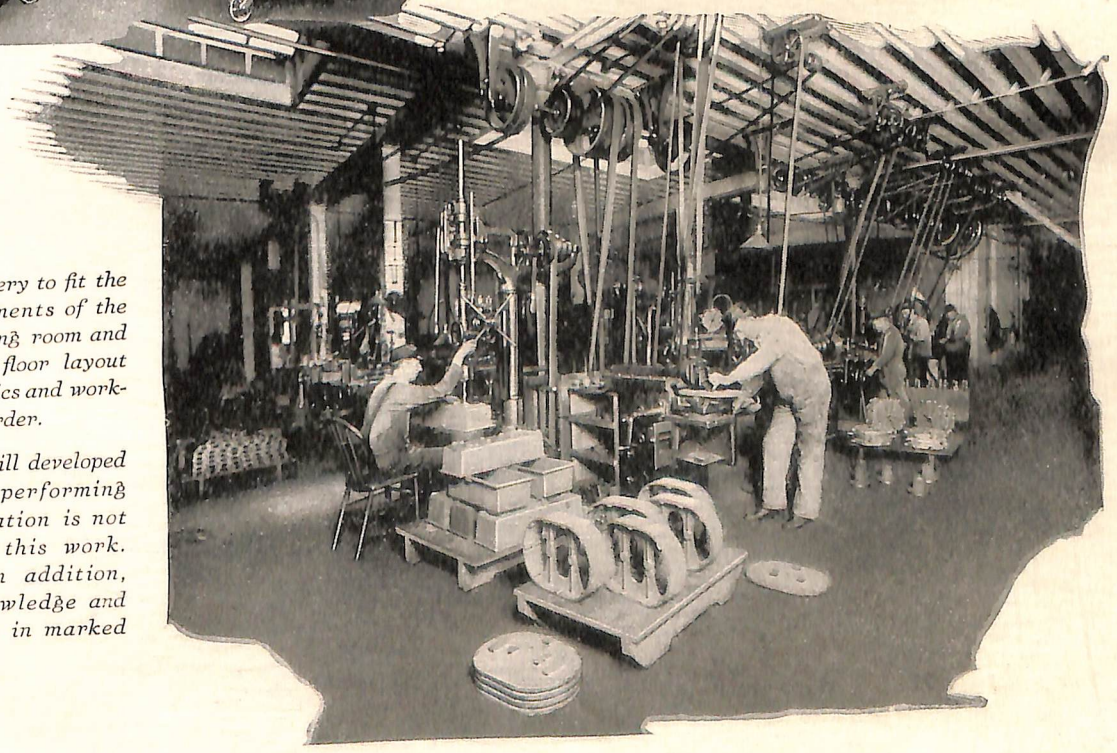
As wages have gone up efficiency has come down. Increased rents and building costs, the high prices of raw materials and a general increase of the scale on which modern business is conducted, have made it necessary for the manufacturer who markets his product in a bottle, to turn more and more to machinery as his best friend and ally in keeping his costs down and his volume of production up.

That machine processes are better than hand operations for work that has to be done over and over again in exactly the same manner, is well known. In the Bottling Plant, where the work is largely standardized, labor saving devices of all kinds are especially desirable.

Substituting machinery for manual labor of any kind means substituting precision for fallible human judgment, it means replacing irregularity of effort with regularity; it means tireless energy in place of easily fatigued muscles; it means large production quickly in place of small production slowly. With machinery it is possible to attain the same output cheaper or a larger output at the same cost—either of which means larger profits.

Our Machinery Division is located at 4015 North Rockwell Street, Chicago, Illinois. Known as the U. S. Bottlers Machinery Company, and under the direction of Mr. A. I. Risser, President and General Manager, this Division is continuously spending time, money and effort in designing and producing Automatic Machines for





Building machinery to fit the special requirements of the individual bottling room and its particular floor layout requires mechanics and workmen of a high order.

The ordinary skill developed by repeatedly performing the same operation is not sufficient for this work. It requires, in addition, engineering knowledge and resourcefulness in marked degree.

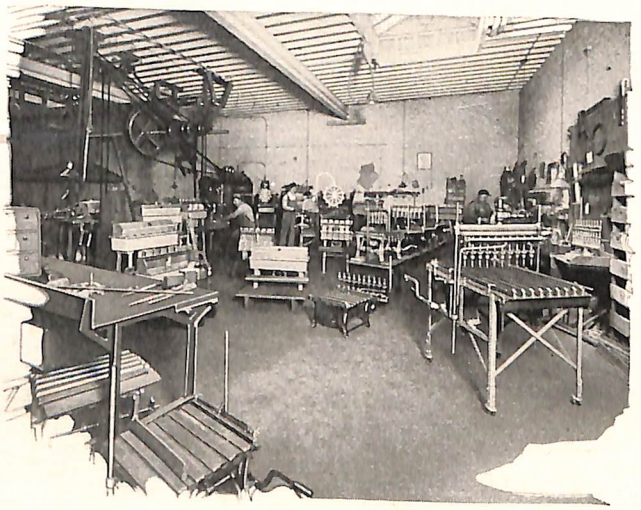
Bottle Washing, Filling, Corking, Capping, Labeling and Conveying to supplant the costly processes of performing these operations by hand.

In fact, through the use of our Machinery in the Bottling Room, many manufacturers have been able to more than double their production on the same floor space without additional help—a situation which has given rise to the slogan of this Division—"More Output With Less Labor."

Beside building a wide variety of standard machines and devices of our own design and patent, we make a specialty of laying out and constructing equipment of the "made to measure" variety. It has been our experience that nearly every Bottling Establishment, due to the nature of its product, its method of handling or peculiar floor arrangement, requires the special treatment of an individual case.

It is a good deal like tailoring men's suits. Every man wears one, but if it is to fit, it must be "made to his measure"—and seldom are two of them identically alike.

It is this peculiar condition that makes it necessary to have a high order of engineering skill, inventiveness and ingenuity to cope with the problems that are run into in building and placing the special equipment required in the Bottling Room. In each installation the machines must be placed in relation to each other so that they form an unbroken and continuous line from the first to the last operation.

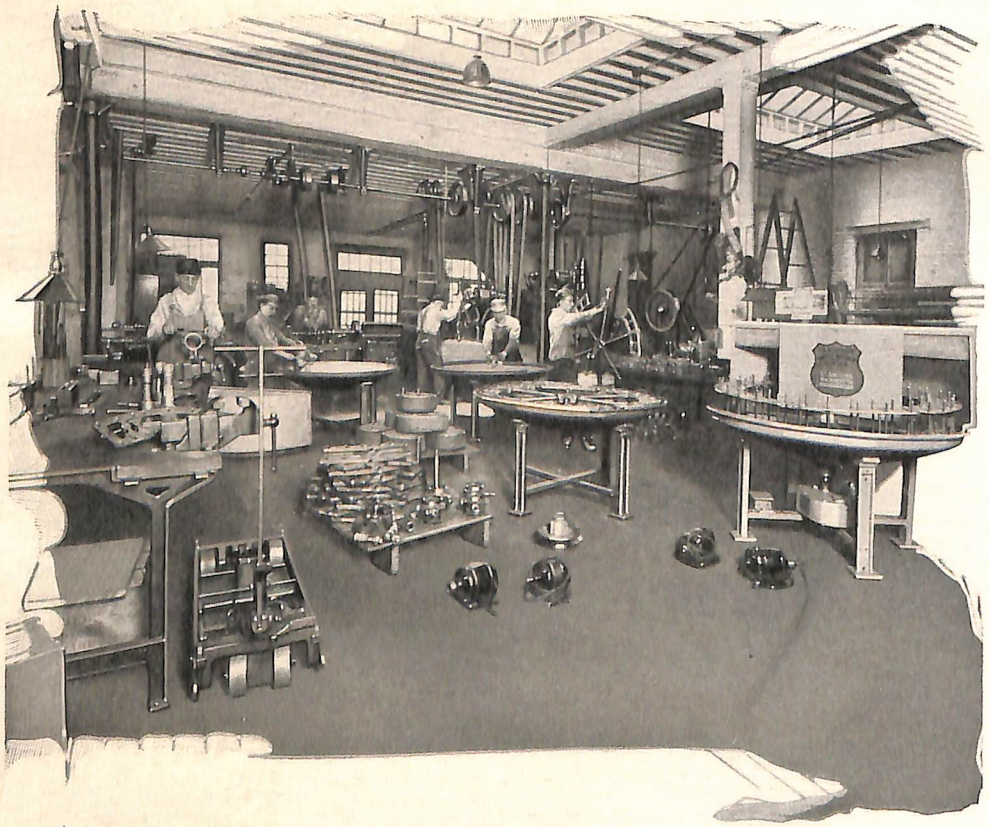


Filling machines and filter drums under construction

With such a system the spacing and speed of each machine must be nicely and delicately adjusted, so the operator may work comfortably and without shifting his position—thus saving effort, time and lost motion.

We have often equipped the Bottling Room of an establishment and redesigned it, as far as the position of its machinery is concerned, with the result that the original, faulty, cramped and inconvenient arrangement has been entirely overcome, space has been gained, output greatly increased and manual labor diminished.

Such, in brief, is the important function and service of our Machinery Division.



Another interior view of our Machinery Division. Automatic Machinery for Bottle Washing, Filling, Corking, Capping, Labeling and Conveying is here produced and designed to supplant the costly processes of performing these operations by hand.

CORK DIVISION

AFTER a bottle is made and filled with the contents it is destined to hold, the next important step is selecting a stopper.

With this in mind, it is not difficult to see how we became interested in the Cork Industry—and how we felt, that in order to make this end of our service complete, we should have a Cork Factory of our own that would give us the quality stoppers we desired to go with "Diamond I" Bottles.

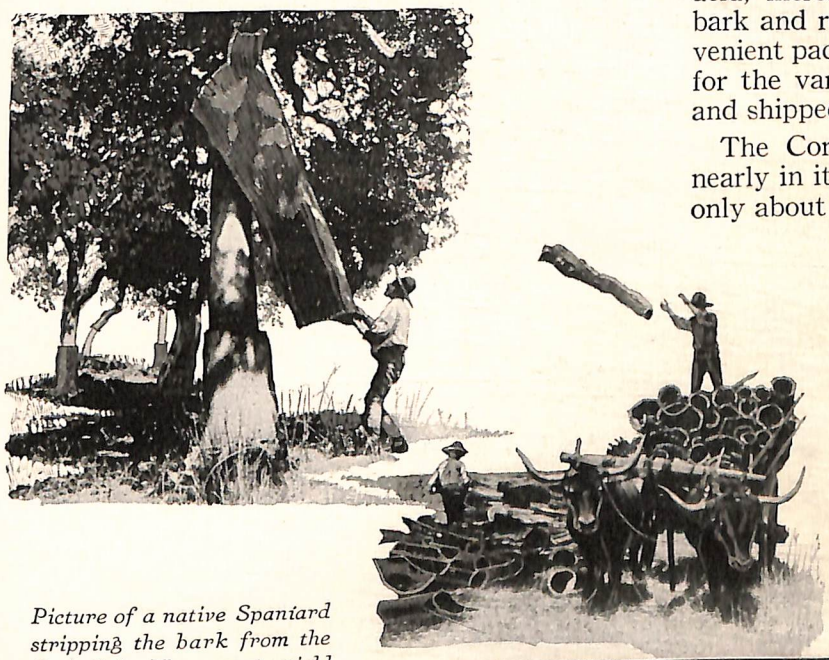
Cork is the natural bark of the Cork Oak Tree which flourishes principally in Spain and Portugal, and to a lesser degree in Morocco and Algeria.

When the Cork Oak gets to be about forty years old, it begins to yield its best bark and continues productive as a rule for almost a century. Cork of the first barking is so coarse, rough and dense in texture that it is of little commercial value. The second and subsequent barkings, however, which occur about nine or ten years apart, are much better and constitute the cork of commerce.

After the bark is removed, it is gathered up in piles and left for a few days to dry. After being weighed it is next carried either in wagons or on the backs of burros to the boiling station, where it is stacked and allowed to season for a few weeks. It is then ready for the boiling process, after which the rough useless outer coating is scraped off. The boiling also serves to remove the tannic acid, increase the volume and elasticity of the bark and render it flat, soft and pliable for convenient packing. After being sorted and resorted for the various grades and qualities, it is baled and shipped to the ports of the world.

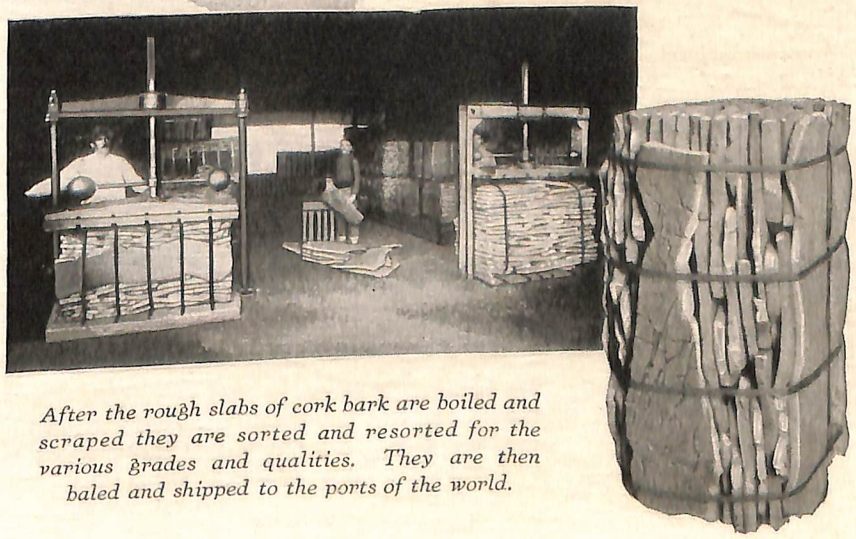
The Cork Wood, as it is imported, is very nearly in its natural state, and, in working it up, only about 25% can be used for making the ordinary bottle cork. It is fortunate, therefore, that this large waste can be utilized for such a wide range of products as linoleum, insulation, fishing rod handles, floats of various kinds, life preservers, etc., etc.

Cork is one of those products that we accept from Nature just as it comes. The manufacturing process that it undergoes changes only its outward form—its physical composition remains exactly the same. Most articles in the process of



Picture of a native Spaniard stripping the bark from the Cork Oak. The average yield of the Cork Oak is about 50 pounds.

Cork in its various forms has been in the service of mankind over 2,000 years. In Spain and Portugal the growing of Cork is quite an industry. Over 800 cork factories are found in Spain alone.



After the rough slabs of cork bark are boiled and scraped they are sorted and resorted for the various grades and qualities. They are then baled and shipped to the ports of the world.

manufacture can be refined to a certain extent. but nothing can be done to make cork wood more uniform in structure or texture.

The manufacturing process starts with the slicing of the irregular pieces of cork wood into strips, the width of the strip determining the length of the cork. These strips are then run through punching machines where revolving cylindrical knives with razor like edges cut out cork cylinders.

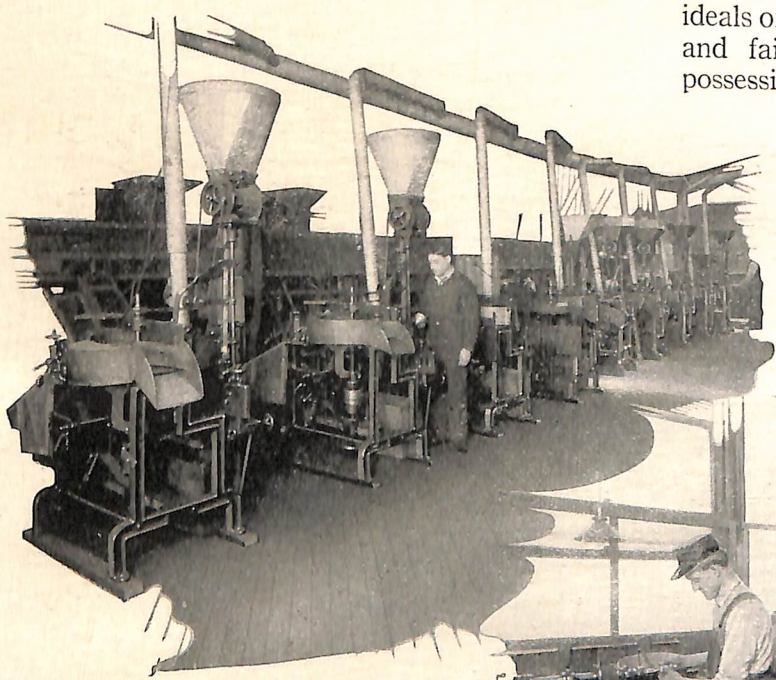
Next comes the Tapering Process. This is accomplished by an intricate machine in which a delicate mechanism grasps each cork between two nicely adjusted fingers and holds it against the edge of a large flat circular knife which trims off a fine shaving just at the proper angle. The corks are then given a cleansing bath which delivers them fresh and clean, ready for those who are to perform the grading and sorting operation. After this they are put in clean, strong paper bags, enclosed in tight muslin sacks to keep out dust and dirt.

In the Cork Industry there are no set or recognized standards of quality for the various grades produced. It is not at all strange to find the first grade of one manufacturer of about the same quality as the second grade of another manufacturer.

This is purely a matter of care and thoroughness on the part of the company in directing the eyesight and judgment of individual expert employees. We always make it a point to see that there is no shortage in count, no skimping in length and no adulterating with an inferior grade or quality.

The only safe course for the buyer of corks is to purchase those brands whose quality is rigidly maintained at all times, even in the face of price cutting competition. In short, the customer must let the reputation of the manufacturer be his guarantee of quality.

Mr. S. D. Simpson is President and General Manager of our well equipped and modern Cork Factory located at 1245 South Wabash Avenue, Chicago, Ill. This Division is known as the Chicago Cork Works Company. "Diamond I" Corks have been on the market for years and are backed up by standards of selection and the ideals of a Company whose reputation for honesty and fair dealing is one of its most priceless possessions.



To the left—a row of cork tapering machines in our factory at 1245 South Wabash Ave., Chicago.



The slicing and punching operation is illustrated at the right.

After the rough slabs of cork bark are cut into strips, the latter are run through punching machines where rapidly revolving knives with razor like edges cut out cork cylinders.

CHEMICAL GLASSWARE DIVISION

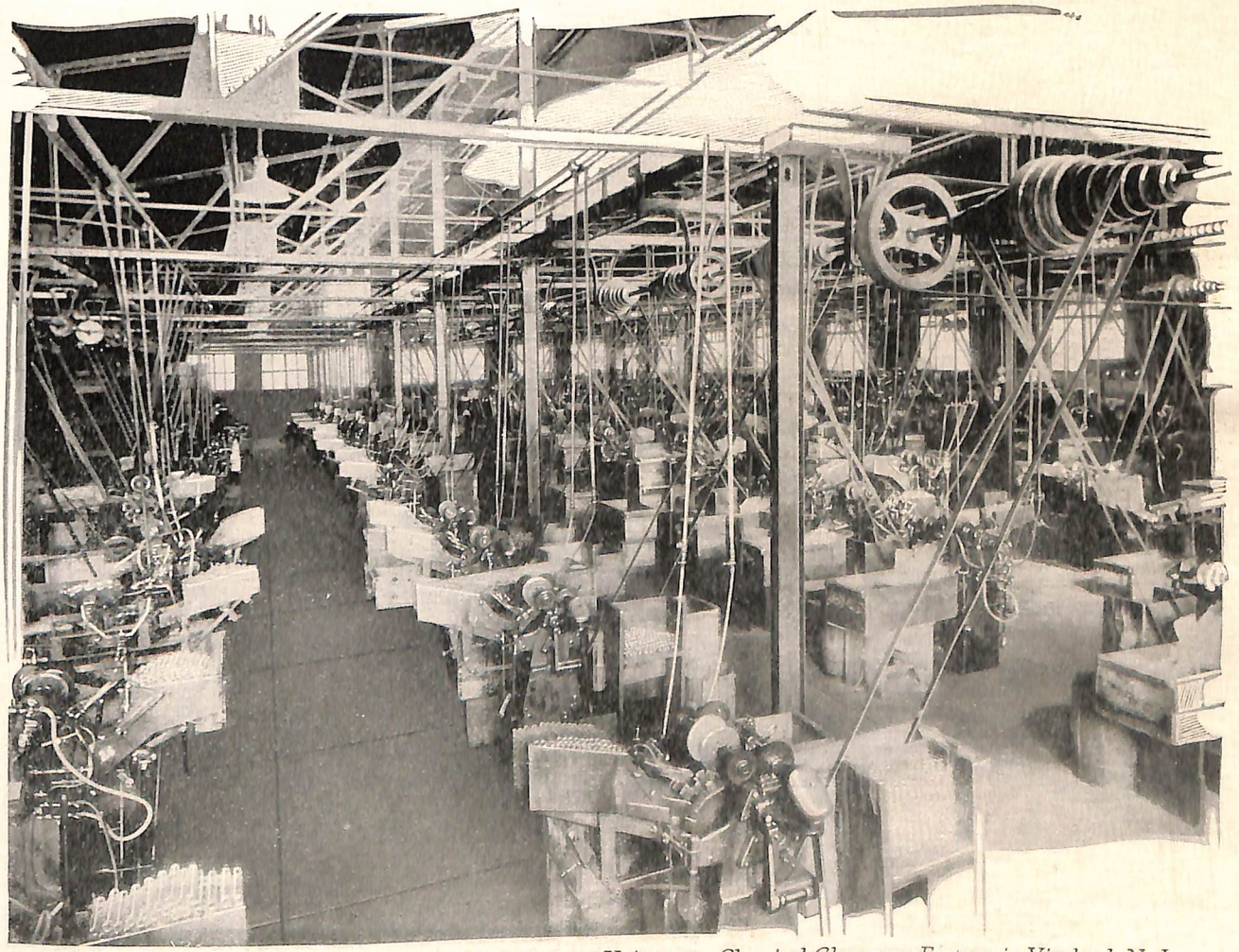
SCIENCE has been largely responsible for the remarkable advances and progress of present day industry—and the laboratory, of course, is the work shop of science. In the days when superstition stalked the earth, the laboratory was considered the rendezvous of alchemists and the place where shy men communed with evil spirits. It has now lost this sinister meaning, and is almost a word to conjure with.

The study of scientific principles and the action and reaction of chemicals and metals, one upon another, has developed from a mere study, confined to schools and monastaries, to a great dynamic force that has stirred industry to its very foundation, introducing new processes and pointing the way to undreamed of developments.

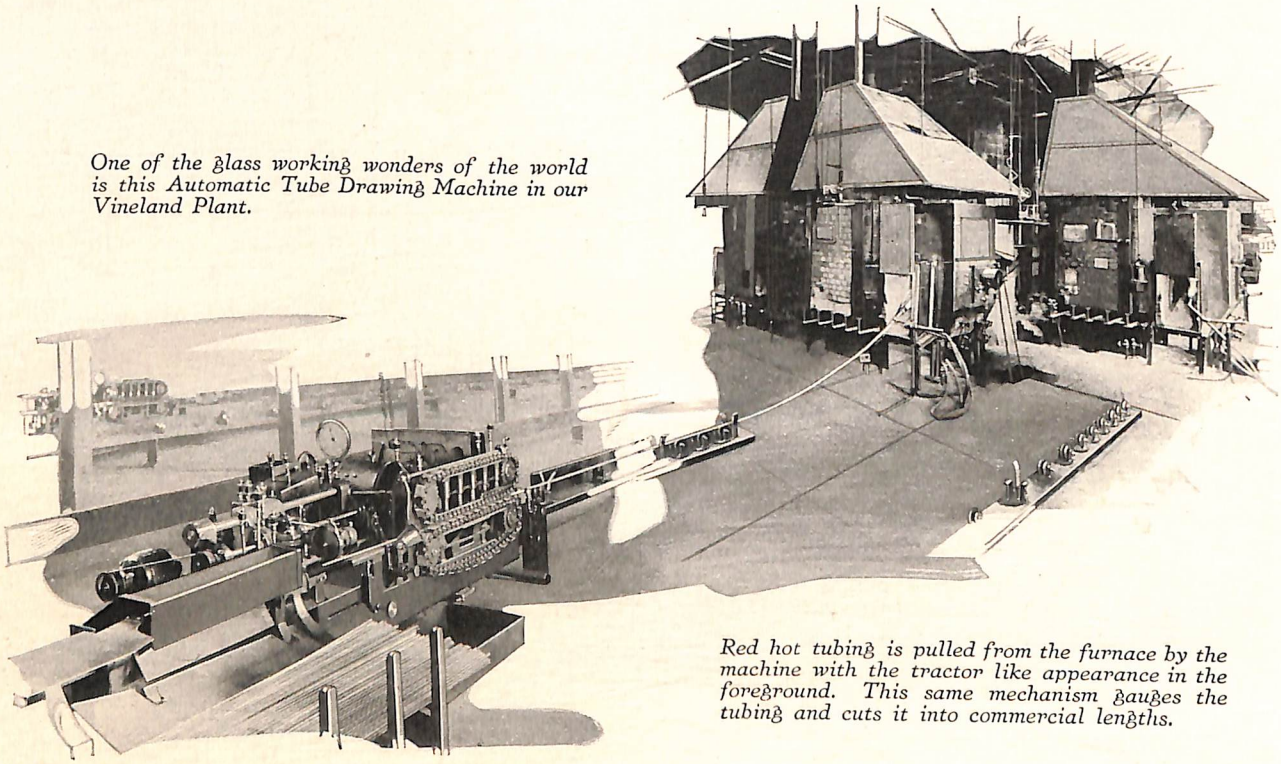
The manner in which the Illinois Glass Company became interested and started into the field of Chemical Glassware is as simple and natural as its entrance into the other lines we have just described. We found, especially in the proprietary field, that many of the concerns using bottles, also manufactured commodities such as Pills, Powders, Tablets, etc., which they put up in Homeopathic Vials.

The Homeopathic Vial is a glass container the same as the bottle, and belongs to the bottle family although manufactured in an entirely different way. While bottles are made direct from the molten glass, vials are made from glass tubing.

Like the Bottle Industry, the Manufacture of Tubing and Vials has recently changed from a hand process to a machine operation. In our



This photograph indicates the size of the Vial Machine Unit at our Chemical Glassware Factory in Vineland, N. J. It consists of 125 machines with a capacity in excess of 5,000 gross of vials daily.



One of the glass working wonders of the world is this Automatic Tube Drawing Machine in our Vineland Plant.

Red hot tubing is pulled from the furnace by the machine with the tractor like appearance in the foreground. This same mechanism gauges the tubing and cuts it into commercial lengths.

Plant at Vineland, New Jersey, we have a Tube Drawing Machine that has revolutionized the production of glass tubing. The capacity of this machine is enormous, and its product is superior in every way to the old hand drawn tubing. It pulls out of the glass tank, to which it is attached, mile after mile of tubing uniform in diameter and in thickness of glass wall. In the operation of this machine, we enjoy exclusive rights.

Even the Vial is not free from the invasion of machinery, and we have in our Vineland Plant the largest battery of Homeopathic Vial Machines in the world. In this product, too, the human element has been largely eliminated. Uniformity of construction, precision of capacity and measurement is automatically controlled in a manner utterly unattainable in the old lamp room or hand process of vial making.

A great many of our customers today have Laboratories of their own in which they prepare formulas and do a great deal of experimental and research work. In catering to the laboratories of schools and colleges, commercial laboratories and those of industry, we found, especially during the war when the importations of foreign chemical glassware were cut off, that we would have to enter this field in a much larger way than heretofore.

Today, in addition to Homeopathic Vials and Cream Test Glassware, we produce a complete line of Test Tubes, Beakers, Flasks, Graduates, Pipettes, Burettes, and all the intricate chemical glass apparatus used in the experiments of the scientific laboratory.

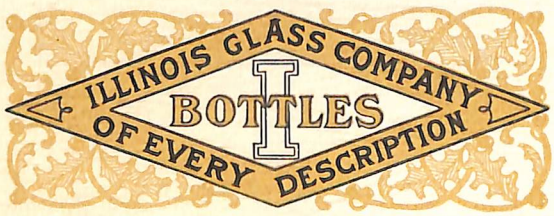
SUMMARY

TO EVERY line of endeavor in which we are engaged, the Twentieth Century has introduced marked changes and radical departures. It has been no easy task to keep abreast of the times in all these diversified fields, and yet, in all of them, we not only have kept up the pace, but have actually excelled to a marked degree.

The effort entailed has been worth while, for it has given a scope and completeness to "Diamond I" Service that has been much appreciated by many buyers, who would rather place their orders with a few, large, dependable houses and know what to expect in return, than to scatter their purchases broadcast over the land and trust to luck and variable standards of quality.

"Everything From The Formula To The Sale" is the slogan we boast today. What a different foundation to stand on, now, in looking into the future, than when we started out in 1873!


Diamond I
BOTTLES
Diamond I
CORKS
Chemical
GLASSWARE
Diamond I
CARBOYS
Bottling
MACHINERY
Corrugated
PRODUCTS
A complete Service in the Bottling, Packaging and Shipping of your product which includes "Everything from the Formula to the Sale"
Diamond I
CARTONS
Diamond I
LABELS
Wood
BOXES
Bottlers
SUPPLIES


ILLINOIS GLASS COMPANY
BOTTLES
OF EVERY DESCRIPTION